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BRITISH IMPERIAL THEORY AND AMERICAN TERRITORIAL POLICY

A Suggested Relationship

ROBERT LIVINGSTON SCHUYLER

Gouverneur Morris Professor Emeritus of History, Columbia University

(*Read April 23, 1953*)

THE Founding Fathers of the new American Republic were sons of the old British Empire. American constitutional relations, in our early national period, were worked out by men who had been born British subjects, had grown up in the British Empire, and had been thinking—and some of them thinking hard—about British imperial relations. These propositions are not likely to be disputed, but their significance has not always been fully appreciated.

In a book published nearly twenty years ago a distinguished American constitutional historian, Andrew Cunningham McLaughlin, went so far as to say that "in essentials American federalism was the child of the old empire."[1] He was thinking about the distribution of powers between the imperial government and the colonial governments in the working practices of the British Empire before the American Revolution and the distribution of powers between the federal government and the state governments provided for in the Constitution of the United States, and he was strongly impressed by the similarity—the almost complete identity, he thought—between the two. He realized that the influence upon the framers of the American federal system exerted by constitutional arrangements within the British Empire, arrangements under which they had grown up and with which they were thoroughly familiar, could not be measured accurately; and he did not claim that there was a definite cause-and-effect relationship between the British imperial and the American federal distribution of powers. But he considered it inadmissible to suppose that Americans, when called upon to organize their own commonwealth, were not influenced at all by their earlier experiences in the British Empire.

In the present article we shall be concerned not with the distribution of powers between central and local governments in the British Empire and in the United States, but with an unquestionable resemblance, and, it seems to me, a probable relationship, between a widely accepted constitutional theory regarding the character of the British Empire and the most distinctive principle of the territorial policy of the United States. It should be understood at the outset that it is on ideas only that we shall be focusing, although in the actual processes of human history ideas do not exist in a state of independence and isolation. They are associated with economic and other interests, with habits and emotions and prejudices, and with much else, no doubt. For present purposes, however, we shall leave out of consideration such facts as that the Scottish-born James Wilson was an active, if not an ardent, speculator in western lands, that Gouverneur Morris was a champion of commercial interests who took a pessimistic view of human nature, and that Thomas Jefferson believed in the simple virtues of agriculture, distrusted speculators, and loved Virginia above all other states in the Union. No attempt will be made at an economic interpretation or a psychological analysis. It should also be made explicit that in dealing with constitutional theories and principles it will be unnecessary to inquire whether they were historically or legally valid. What is important for our purposes is that they were held, proclaimed, and widely accepted. Novelty is not claimed for all the facts to be presented; some of them have been gathered in well-tilled historical fields. Whatever judgment may be passed upon the thesis I am advancing, there seems to be some propriety in presenting it here, for most of my characters, my *dramatis personae*, were members of the American Philosophical Society.

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[1] *A constitutional history of the United States*, 15, note, N. Y., Appleton-Century, 1935. In an article published in 1918, The Background of American Federalism (*Amer. Polit. Sci. Rev.* 12: 215–240, 1918), Professor McLaughlin had developed at greater length the thesis that "the idea of federalism went over from the old empire, through discussion, into the Constitution of the United States." His view has recently been endorsed by the learned legal historian, Francis S. Philbrick, in his Introduction to *The Laws of Illinois Territory, 1809–1818*, cclxxxi, Springfield, Ill., State Hist. Lib., 1950.

The question of the constitutional character of the British Empire was involved in the great controversy of ideas that preceded its disruption, and in this controversy, as we all know, opinion was divided on both sides of the Atlantic. An analysis of the views expressed in the colonies and in Great Britain regarding intra-imperial constitutional relations shows the existence of two opposed theories as to the nature and structure of the Empire which we may designate respectively as the Unitary Theory and the Pluralistic Theory.

In Great Britain everybody who participated in the controversy, except a relatively small number of political radicals, appears to have been an imperial unitarian, to have accepted, that is to say, the view that the British Empire was a single state, legally subject throughout all its parts to the authority of the British Parliament. This view was in accord with the traditions of British colonial policy and the facts of British colonial administration. What may be called the official British doctrine, which had the support, generally speaking, of British ministers and officials, members of Parliament, and the legal profession, was asserted most sweepingly and uncompromisingly in the famous Declaratory Act of 1766, in which it was affirmed that

> the King's Majesty, by and with the advice and consent of the lords spiritual and temporal, and commons of Great Britain, in parliament assembled, had, hath, and of right ought to have, full power and authority to make laws and statutes of sufficient force and validity to bind the colonies and people of America, subjects of the crown of Great Britain, in all cases whatsoever.

Some of the unitarians believed, however, that there were limits to Parliament's legal powers over the colonies, notably in respect of taxation. In America, too, the Empire was generally considered to be a single state, and varying degrees of authority were conceded to Parliament. On the eve of the War of Independence, however, a contrary theory rapidly gained headway, and it is with this that we are here concerned.

The evolution of the Pluralistic Theory in the mind of one man can be traced in the writings of Benjamin Franklin. At the time of the Stamp Act crisis (1765) opinion was still substantially unanimous, in America as well as in Great Britain, that Parliament had authority—some measure of authority at least—over the colonies and that the British Empire formed a single state. The Stamp Act Congress acknowledged "all due subordination to that august body the Parliament of Great Britain." A few months later Franklin, in his examination before the House of Commons (February, 1766), said: "The authority of Parliament was allowed to be valid in all laws, except such as should lay internal taxes. It was never disputed in laying duties to regulate commerce."[2] But later reading and reflection, inspired by the course of events, were soon to turn this imperial unitarian into an imperial pluralist. In March, 1768, he wrote from London to his son, William Franklin:

> The more I have thought and read on the subject, the more I find myself confirmed in opinion that no middle doctrine can be well maintained, I mean not clearly with intelligible arguments. Something might be made of either of the extremes: that Parliament has a power to make *all laws* for us, or that it has a power to make *no laws* for us; and I think the arguments for the latter more numerous and weighty than those for the former. Supposing that doctrine established, the colonies would then be so many separate states, only subject to the same king, as England and Scotland were before the union.[3]

In some observations written in 1769 on a recently published pamphlet Franklin said: "Writers on this subject often confuse themselves with the idea, that all the King's dominions make one state, which they do not, nor ever did since the [Norman] Conquest. Our kings have ever had dominions not subject to the English Parliament."[4]

The American colonies, he believed, had the same constitutional status as Scotland before its union with England in 1707 and as Hanover after the accession of its ruler to the British throne in 1714; they were dominions of the British King but entirely independent of the British Parliament. In October, 1770, he wrote in a private letter: "In fact, the British empire is not a single state; it comprehends many; and though the Parliament of Great Britain has arrogated to itself the power of taxing the colonies, it has no more right to do so than it has to tax Hanover. We have the same King, but not the same legislatures."[5]

By this time other Americans were coming to the same conclusion. One of these was James Wilson of Pennsylvania, better known to history as one of the Founding Fathers of the United

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[2] *The works of Benjamin Franklin*, ed. by John Bigelow, 3: 417, N. Y., 1887.

[3] *Ibid.* 4: 130.

[4] *Ibid.* 4: 308.

[5] *Ibid.* 4: 366–367.

States than for his earlier reflections on the nature of the British Empire and the constitutional status of the colonies. He was a member of the Pennsylvania Provincial Convention and of the Continental Congress, a signer of the Declaration of Independence, a member of the Federal Convention, which framed the Constitution of the United States, and of the Pennsylvania State Ratifying Convention, and an associate justice of the Supreme Court of the United States. Born in Scotland and educated at its universities of St. Andrews, Glasgow, and Edinburgh, he came to America as a young man in his early twenties, in 1765, when the great controversy was well under way, and he took part in it. His principal contribution was a tract, *Considerations on the Nature and Extent of the Legislative Authority of the British Parliament,* written some years before its publication in 1774.[6] He began his study of this subject, so he informed his readers, in the expectation of being able to trace "some constitutional line between those cases in which we ought, and those in which we ought not, to acknowledge the power of parliament over us." He came to the conclusion, however, that no such line could be found, that there was no middle ground "between acknowledging and denying that power in *all* cases." Arguing from natural law and the non-representation of the colonies in Parliament, Wilson deemed it "repugnant to the essential maxims of jurisprudence, to the ultimate ends of all governments, to the genius of the British constitution, and to the liberty and happiness of the Colonies, that they should be bound by the legislative authority of the Parliament of Great Britain." He reasoned that all the members of the British Empire were by right "distinct states, independent of each other, but connected together under the same sovereign, in right of the same crown." To his mind the Empire was an association of equal partners, and the colonial legislatures were constitutionally coordinate with the British Parliament. He spoke of them, indeed, as "parliaments."[7] In a later work he wrote:

> Two sovereign states may employ the same executive magistrate, or bear allegiance to the same prince, without any dependence on each other; and each may retain all its national rights, free and undiminished. This last, under the house of Stuart, was the case of England and Scotland, before the nation of Great Britain was formed by their union. This last, also, was the case of Great Britain and the American colonies, before the political connexion between them was declared to be dissolved.[8]

Wilson's *Considerations* was published in Philadelphia just as the delegates to the First Continental Congress were assembling at Carpenters' Hall, and it is reasonable to assume that some of them were reading and discussing it.

Another publication of 1774 is even more important from our point of view than Wilson's pamphlet because of the leading part played by its author in designing the territorial policy of the United States. In July, 1774, the freeholders of Albemarle County, Virginia, in a meeting at Charlottesville, elected Thomas Jefferson as one of their delegates to a provincial convention to be held at Williamsburg early in the following month, and the resolutions which they adopted as instructions to the delegates were drafted by him. In these resolutions, in which the British colonies were called "states," it was declared that they were rightfully subject to no other legislative authority than that of their own respective legislatures.[9] At the same time Jefferson was writing a document intended for the instruction of the delegates to be chosen by the Virginia Convention to represent the colony in the forthcoming Continental Congress at Philadelphia, and he took copies of it with him when he set out for Williamsburg. Falling ill on the journey and being unable to proceed, he sent on two copies, one of which was laid on the table of the Convention but not acted upon. It was soon printed, however, with the title *A Summary View of the Rights of British America,* in which form it found its way to London and ran through several editions.[10]

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[6] Reprinted in *Selected political essays of James Wilson,* ed. by Randolph G. Adams, N. Y., Knopf, 1930.

[7] The striking resemblance of the twentieth-century conception of the British Commonwealth of Nations to Wilson's theory of the British Empire was pointed out some years ago by the late Burton Alva Konkle in a detailed study of Wilson which, unfortunately, has never been published. His Life and Writings of James Wilson, a typescript nearly 800 pages in length, is at present in the Friends Historical Library of Swarthmore College. Wilson believed that the exercise of authority over the colonies by Parliament was a modern usurpation. He was a lawyer, and, lawyer-like, he cited precedents; and lawyers' precedents are selected with a view to sustaining their arguments. A more objective study would have shown him that from the earliest times English parliaments legislated for the king's dominions outside the realm of England. See R. L. Schuyler, *Parliament and the British Empire* (N. Y., Columbia Univ. Press, 1929), chapters i and ii. But many political and constitutional theories of great influence in their own day have invoked opinions which have later been rejected as historically unsound.

[8] *Selected political essays of James Wilson,* ed. by Randolph G. Adams, 327. For some account of Wilson's imperial ideas, and a discussion of what is here called the Pluralistic Theory in general, see Randolph G. Adams, *Political Ideas of the American Revolution,* ch. iii, Durham, N. C., Trinity College Press, 1922.

[9] For the Albemarle Resolutions, see *The papers of Thomas Jefferson,* ed. by Julian P. Boyd, 1: 117–119, Princeton Univ. Press, 1950.

Like Wilson, Jefferson concluded that Parliament had no right to exercise any authority whatever over the colonies and that the colonial legislatures were the equals of Parliament in constitutional status, though the premises of the two men were not identical. Wilson believed that the bond of allegiance to the English king had not been broken by his subjects when they left their mother country and came to America, while, according to Jefferson, on the other hand, the original English colonists, in emigrating to America, had exercised their natural right—"a right which nature has given to all men"—of leaving the country in which they had been born and establishing new societies under such laws as might seem most likely to promote public happiness. Their emigration was similar in essentials, Jefferson declared, to that of their Saxon ancestors, who left their native woods and wilds on the Continent of Europe and conquered Britain; and no claim of superiority over those Saxon conquerors of Britain was ever asserted by "that mother country from which they had emigrated." Similarly, "America was conquered, and her settlements made and firmly established, at the expense of individuals, and not of the British public." The British king, Jefferson admitted, possessed executive powers in the colonies, but his authority over them was not something inevitably brought with them by the original settlers.[11] It was, on the contrary, a result of voluntary action on the part of the colonists:

> settlements having been thus effected in the wilds of America, the emigrants thought proper to adopt that system of laws under which they had hitherto lived in the mother country, and to continue their union with her by submitting themselves to the same common sovereign, who was thereby made the central link connecting the several parts of the empire. . . .[12]

In his *Autobiography,* written by Jefferson in his old age, he said that the ground he had taken in the *Summary View* was that which from the beginning he had thought to be the only sound or tenable one, namely,

> that the relation between Great Britain and these colonies was exactly the same as that of England and Scotland, after the accession of James and until the union, and the same as her present relations with Hanover, having the same executive chief, but no other necessary political connection; and that our emigration from England to this country gave her no more rights over us, than the emigration of the Danes and Saxons gave to the present authorities of the mother country [Denmark and Saxony] over England.

The Pluralistic Theory of the British Empire spread so quickly that it would be correct to say that it came to be accepted before the end of 1774 by a great many, if not by most, of those whom we may call the revolutionists, while they were still speaking as British subjects. It may be regarded as part of that revolution which, according to John Adams in his reminiscent old age, took place in the minds and hearts of Americans before the War of Independence began. In the original draft of a series of well known resolutions adopted by the First Continental Congress on October 14, 1774, the *exclusive right* of internal legislation was claimed for the colonial legislatures in these words:

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[10] In his Autobiography, begun many years later, when he was seventy-seven years old, Jefferson gave an account of this incident. Speaking of this document, he said: "It was read generally by the members, approved by many, though thought too bold for the present state of things; but they printed it in pamphlet form, under the title of 'A Summary View of the Rights of British America.' It found its way to England, was taken up by the opposition, interpolated a little by Mr. Burke so as to make it answer opposition purposes, and in that form ran rapidly through several editions." Jefferson's Autobiography has often been reprinted.

[11] The difference between Jefferson's premises and Wilson's is pointed out by Anthony M. Lewis in Jefferson's *Summary View* as a Chart of Political Union, *William and Mary Quart.*, 3rd ser., 5, 34–51, 1948.

[12] To quote from Professor Thomas P. Abernethy's Introduction to his edition of the *Summary View:* "Jefferson's line of argument was something new. He conceived that when the colonists migrated to America without material aid from the Crown, they reverted automatically to a state of nature and were consequently free to adopt such government and laws as should please them. Of their own accord they chose to look upon the King of England as their sovereign, and the various Royal charters constituted compacts between subjects and sovereign. The powers of the King were therefore limited by the charters, and he had no right to revoke them without the consent of the colonists. If he did so, his authority could be denied." Jefferson was probably considerably influenced by a pamphlet written by Richard Bland of Virginia. See below, pp. 321–322.

> That the power of making laws for ordering or regulating the internal polity of these Colonies is, within the limits of each colony, respectively and exclusively vested in the provincial legislature of such colony; and that all statutes for ordering or regulating the internal polity of the said colonies, or any of them, in any manner, or in any case whatsoever, are illegal and void.

Somewhat softened in phraseology, though not at all so in meaning, this appears in the resolutions as finally adopted in the following form:

> That the foundation of Engish liberty, and of all free government, is a right in the people to participate in their legislative council, and as the English colonists are not represented, and from their local and other circumstances, cannot properly be represented in the British parliament, they are entitled to a free and exclusive power of legislation in their several provincial legislatures, where their right of representation can alone be preserved, in all cases of taxation and internal polity, subject only to the negative of their sovereign, in such manner as has been heretofore used and accustomed.

And the following was added with regard to the regulation of external trade:

> But, from the necessity of the case, and a regard to the mutual interest of both countries, we cheerfully consent to the operation of such acts of the British parliament as are, bona fide, restrained to the regulation of our external commerce, for the purpose of securing the commercial advantages of the whole empire to the mother country, and the commercial benefits of its respective members; excluding every idea of taxation, internal or external, for raising a revenue on the subjects, in America, without their consent.[13]

This resolution, it will be noted, went beyond a claim to exemption from parliamentary authority in internal affairs; it implied a questioning, if not a positive denial, of parliament's *right* to legislate even for the external commerce of the colonies. For clarification of its meaning reference may be made to some statements written soon after by its principal draftsman, John Adams. In his "Novanglus" papers, which appeared in the Boston *Gazette* in 1774, one finds, amidst much tiresome detail, some illuminating sentences:

> The truth is, the authority of parliament was never generally acknowledged in America. . . . We had considered ourselves as connected with Great Britain, but we never thought parliament the supreme legislature over us. We never generally supposed it to have any authority over us, but from necessity, and that necessity we thought confined to the regulation of trade, and to such matters as concerned all the colonies together. . . . Distinct states may be united under one king. And those states may be further cemented and united together by a treaty of commerce. This is the case. We have, by our own express consent, contracted to observe the Navigation Act, and by our implied consent, by long usage and uninterrupted acquiescence, have submitted to the other acts of trade, however grievous some of them may be. This may be compared to a treaty of commerce, by which those distinct states are cemented together, in perpetual league and amity.[14]

To Adams' mind the British Empire was a league of equal states with a common executive head. George III was King of Massachusetts, and of each of the other colonies, as well as King of Great Britain and King of Ireland, and Adams wished that he would formally assume those titles.[15]

The rights of the colonists as set forth by the Continental Congress in 1774 were explicitly declared to be derived from three sources: "the immutable laws of nature, the principles of the English constitution, and the several charters or compacts." It is pertinent to the present thesis to emphasize these "charters or compacts." In the course of the great controversy much was said about the colonial charters as guarantees of colonial rights. They were regarded as containing binding compacts between the crown, by whose authority they had been granted, and the inhabitants of the colonies. A pamphlet that had some influence, especially on Jefferson, was *An Enquiry into the*

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[13] For evidence of the travail in which this resolution was born, see *The works of John Adams,* ed. by Charles Francis Adams, 2: 370, 373–374, Boston, 1850. In comment upon the last part of the resolution, that which relates to the regulation of the external commerce of the colonies, Carl Becker said that its phrasing "admits the authority of Parliament as of fact, . . . does not expressly deny it as of right, but . . . by implication leaves it to be supposed that the exercise of that authority both as of fact and of right is dependent upon the consent of the colonies, which at present they give but may in future withdraw." *The Declaration of Independence,* 124, N. Y., Knopf, 1922.

[14] For the "Novanglus" papers, see *The works of John Adams,* ed. by Charles Francis Adams, 4: 11–177.

[15] As early as 1771 James Lovell, in an oration delivered at Boston in commemoration of the "Boston Massacre" of the preceding year, spoke of George III as "king of America." H. Niles, *Principles and acts of the Revolution in America,* 3, Baltimore, 1822. I am indebted for this reference to Professor Charles H. McIlwain.

Rights of the British Colonies, written by Richard Bland of Virginia and first published in 1766.[16] If men had, as Bland believed they had, a natural right to leave their own country and form new political societies, or states, Englishmen must have had a right, "by compact with the sovereign of the nation," to form new states "upon the terms of the compact." In such cases, he said, "the terms of the compact must be obligatory and binding upon the parties; they must be the magna charta, the fundamental principles of government, to this new society; and every infringement of them must be wrong, and may be opposed." Such compacts, according to Bland, had been entered into between the English king and those of his subjects who had established themselves in America, and they were to be found in the charters under which English America had been settled. References to colonial charters in support of American claims continued down to the final crisis, and the idea that the charters constituted compacts between the king and his subjects in the colonies was accepted doctrine among the future revolutionists. Some passages in John Adams' "Novanglus" papers may be regarded as a commentary on the reference to "charters or compacts" in the declaration of the Continental Congress. The king, Adams wrote,

> had a right to enter into a contract with his subjects, and stipulate that they should enjoy all the rights and liberties of Englishmen forever, in consideration of their undertaking to clear the wilderness, propagate Christianity, pay a fifth part of ore, &c. Such a contract as this has been made with all the colonies, royal governments, as well as charter ones. For the commissions to the governors contain the plan of the government, and the contract between the king and subject in the former, as much as the charters in the latter . . . by the charters, and other express and implied contracts made between the Americans and the kings of England, they have bound themselves to fealty and allegiance to the natural person of that prince, who shall rightfully hold the kingly office in England. . . .

A quarter of a century after the Declaration of Independence James Madison had occasion to formulate his constitutional interpretation of the American Revolution, and he based it squarely on the Pluralistic Theory of the British Empire. It occurs in a report, written by him, of a committee of the Virginia legislature, appointed in the session of 1799–1800 to consider communications from various states relative to the recent Virginia Resolutions concerning the Alien and Sedition Laws. In this Madison said:

> The fundamental principle of the Revolution was, that the Colonies were co-ordinate members with each other and with Great Britain, of an empire united by a common executive sovereign, but not united by any common legislative sovereign. The legislative power was maintained to be as complete in each American Parliament, as in the British Parliament. And the royal prerogative was in force in each Colony by virtue of its acknowledging the King for its executive magistrate, as it was in Great Britain by virtue of a like acknowledgment there. A denial of these principles by Great Britain, and the assertion of them by America, produced the Revolution.
>
> There was a time, indeed, when an exception to the legislative separation of the several component and co-equal parts of the empire obtained a degree of acquiescence. The British Parliament was allowed to regulate the trade with foreign nations, and between the different parts of the empire. This was, however, mere practice without right, and contrary to the true theory of the Constitution. The convenience of some regulations, in both cases, was apparent, and as there was no legislature with power over the whole, nor any constitutional pre-eminence among the legislatures of the several parts, it was natural for the legislature of that particular part which was the eldest and the largest to assume this function, and for the others to acquiesce in it. This tacit arrangement was the less criticised, as the regulations established by the British Parliament operated in favor of that part of the empire which seemed to bear the principal share of the public burdens, and were regarded as an indemnification of its advances for the other parts. As long as this regulating power was confined to the two objects of conveniency and equity, it was not complained of nor much inquired into. But, no sooner was it perverted to the selfish views of the party assuming it, than the injured parties began to feel and to reflect; and the moment the claim to a direct and indefinite power was ingrafted on the precedent of the regulating power, the whole charm was dissolved, and every eye opened to the usurpation. The assertion by Great Britain of a power to make laws for the other members of the empire *in all cases whatsoever,* ended in the discovery that she had a right to make laws for them *in no cases whatsoever.*[17]

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[16] Nearly fifty years later, Jefferson gave Bland this high praise: "He was the most learned and logical man of those who took prominent lead in public affairs. . . . He wrote the first pamphlet on the nature of the connection with Great Britain which had any pretension to accuracy of view on that subject. . . ." *The writings of Thomas Jefferson,* ed. by H. A. Washington, 4: 485, Washington, Taylor & Maury, 1854.

[17] *The writings of James Madison,* ed. by Gaillard Hunt, 6: 373–374, N. Y., Putnam's Sons, 1906.

The Pluralistic Theory of the Empire was not held by Americans exclusively. There was constant correspondence and interchange of ideas between reformers in the colonies and in Great Britain both before and after independence was declared, and British radicals, who were agitating for parliamentary reform at home, were also sympathetic toward colonial resistance to parliamentary authority. Thus on the eve of the War of Independence Major John Cartwright, "The Father of Reform," as he came to be called in England, proposed (in a pamphlet entitled *American Independence the Interest and Glory of Great Britain*) an act of Parliament to declare that it was contrary to the welfare of the colonists, and to their "natural inherent rights as men," to be ruled by the British Parliament, and that the colonies were by right "free and independent states," with the King as the head of each. He suggested as an appropriate name for this association of co-equal states "The Grand British League and Confederacy." Other British radicals expressed similar views as to the rightful relationship of constitutional equality between the colonies and Great Britain.[18]

In becoming independent of Great Britain, the American colonies (states, as they now called themselves) were confronted with the problem of establishing a colonial system of their own, and for present purposes it is important to realize that they conceived of the problem as such. During and after, as well as before, the War of Independence communities in the west, both actual and prospective, were commonly spoken of as "colonies."[19] For example, in the course of a debate in the House of Representatives on the admission of Tennessee, in 1796, Albert Gallatin referred to the inhabitants of what was then called "The Territory of the United States South of the River Ohio" as being in a "Colonial state" and of the legislature of a territory as a "Colonial Legislature."[20] This colonial problem with which the new Republic had to deal involved a great controversy between the states of the American union over the ownership of the territory between the Appalachian Mountains and the Mississippi River and the government of those who inhabited, or were to inhabit, it. Actually this problem and this controversy antedated the Revolution.

In 1754 the colonial commissioners assembled in the Albany Congress of that year recommended "that the bounds of those colonies which extend to the South Sea be contracted and limited by the Alleghany or Appalachian mountains, and that measures be taken for settling from time to time colonies of His Majesty's protestant subjects westward of said mountains in convenient cantons to be assigned for that purpose. . . ."[21] In Franklin's well-known Plan of Union, which the Congress approved, the proposed intercolonial federal government was to purchase from the Indians for the Crown "lands not now within the Bounds of particular colonies, or that shall not be within their Bounds when some of them are reduced to more Convenient Dimensions." Among the reasons for this provision in the Albany Plan Franklin gave the following:

> Several of the colony charters in America extend their bounds to the South Sea, which may be perhaps three or four thousand miles in length to one or two hundred miles in breadth. It is supposed they must in time be reduced to dimensions more convenient for the common purposes of government.[22]

The proposed federal government was also to have authority to provide for new settlements on lands purchased from the Indians by making grants of land in the king's name. Among the reasons given by Franklin for this provision was that individual colonies were not strong enough to extend themselves by new settlements so far from the old ones, but that the combined strength of the proposed federation might establish new colonies, or extend an old colony, "greatly to the security of our present frontiers, increase of trade and people, . . . and speedy settlement of the intermediate lands."[23] The same authority was to have power to make laws for the government of such new settlements until the Crown should see fit to establish separate governments for them. The reason for this, according to Franklin, was that

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[18] R. L. Schuyler, *The fall of the old colonial system*, 55–63, Oxford Univ. Press, 1945. See also a chapter on "Activities and Views of the Radicals" in Dora Mae Clark, *British opinion and the American Revolution*, New Haven, Yale Univ. Press, 1930.

[19] See, e.g., *The papers of Thomas Jefferson*, ed. by Julian P. Boyd, 6: 600 ff., Princeton, 1952. George Bancroft in his *History of the United States* dealt with the Northwest Ordinance of 1787 and its antecedents in a chapter entitled "The Colonial System of the United States"; and "Founding a Colonial System" is the title of the chapter in Andrew Cunningham McLaughlin's *The Confederation and the Constitution* describing the establishment of the territorial system of the United States. Of the Northwest Ordinance he said: "It crystallized the principles of colonial organization about which men had been disputing for a generation."

[20] *Annals of the Congress of the United States*, Fourth Congress, 1st Session, H.R., May 6, 1796, col. 1320, 1321. For the use of the word "colonial" where we today would use the word "territorial," see Philbrick, *op. cit.*, ccxcii–ccxciii.

[21] E. B. O'Callaghan, *Documentary history of the State of New York* 2: 356, Albany, Weed, Parsons & Co., 1849.

[22] *Works of Franklin*, ed. by Jared Sparks, 3: 47, Boston, 1836.

> the making of laws suitable for the new colonies . . . would be properly vested in the president-general and grand council [the proposed federal government]; under whose protection they must at first necessarily be, and who would be well acquainted with their circumstances, as having settled them. When they are become sufficiently populous, they may by the Crown be formed into complete and distinct governments.[24]

Though the Albany Plan never went into operation, the idea of limiting the westward extension of individual colonies was not forgotten.

Before the beginning of the War of Independence claims to territory west of the mountains, based on old colonial charters, were often asserted; and during and after the war similar claims were made on behalf of the now independent states. These were based on the principle that the states, as individual sovereigns, had retained all rights, possessions, and jurisdictions which they had possessed as British colonies. But in spite of many and vigorous assertions of this principle, the idea of collective colonization and control of the west was not forgotten. Thus in a "Sketch of Articles of Confederation" presented by Franklin in the Second Continental Congress, in July, 1775, a proposed federal congress was to settle all disputes between the colonies "about limits or any other cause, if such shall arise; and the planting of new Colonies when proper."[25] And in the first draft of the Articles of Confederation, reported to the Continental Congress by a committee on July 12, 1776, it was provided that the United States should have power to limit "the Bounds of those Colonies, which by Charter or Proclamation, or under any Pretence, are said to extend to the South Sea," to assign "Territories for new Colonies, either in lands to be thus separated from Colonies and heretofore purchased or obtained by the Crown of Great Britain from the Indians, or hereafter to be purchased or obtained from them," and to dispose of "all such lands for the general Benefit of all the United Colonies." These provisions in the first draft of the Articles of Confederation were omitted in the later drafts. Maryland was one of the states that could not advance charter claims to lands west of the mountains, and the Maryland delegates to the Continental Congress urged that those lands be disposed of for the common benefit of the United States.[26]

Of all the states, Virginia asserted the most extensive claims to western territory, and she took the lead in opposing the Maryland doctrine that the west belonged to the United States collectively. There was an animated discussion of the western question in the Continental Congress when the first draft of the Articles of Confederation was under debate there in July, 1776, in the course of which Jefferson, speaking as one of Virginia's delegates, upheld Virginia's claim but was in favor of voluntary limitation of colonial charter claims by the states themselves.[27] Living in the Virginia piedmont, he was naturally interested in justice for Virginia's western settlements, and in his *Summary Views* he had shown this interest clearly.

In Jefferson's draft of the Virginia State Constitution, written some time before the middle of June, 1776, he contemplated the creation of new colonies (states) west of the Alleghenies, after the Virginia legislature had taken the necessary action. Such new colonies, the draft provided, "shall be established on the same fundamental laws contained in this instrument and shall be free and independent of this colony and of all the world." This implied equality in constitutional status as between the contemplated new colonies and the old colonies, then in process of becoming independent states. However, in the Virginia Constitution, as adopted by the Virginia Convention on June 29, 1776, the independence of territories that might be laid off from Virginia west of the Alleghenies was not specified.[28]

But the principle of equality of constitutional status for new states lived on, to become the most distinctive feature of American territorial policy. Less than four months after independence was declared, the Maryland Convention resolved, on October 30, 1776, that such lands as might be conquered by the united strength of the states

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[23] *Ibid.* 3: 48–49.

[24] *Ibid.* 3: 49.

[25] *American Archives*, ed. by Peter Force, 4th ser., 2: 1887 ff., Washington, 1839.

[26] *Ibid.*, 5th ser., 3: 788.

[27] Notes of Debates in the Continental Congress by John Adams, *Journals of the Continental Congress*, ed. by Worthington C. Ford, 6: 1071 ff., Washington, Govt. Print. Off., 1906.

[28] For Jefferson's drafts of the Virginia Constitution and the text of the constitution as adopted by the Virginia Convention, see *The papers of Thomas Jefferson*, ed. by Julian P. Boyd. 1.

"ought to be considered as a common stock to be parcelled out at proper times into convenient, free, and independent governments."[29] A year later it was moved by Maryland in the Continental Congress (October 15, 1777) "that the United States in Congress assembled shall have the sole and exclusive right and power to ascertain and fix the western boundary of such States as claim to the Mississippi or South Sea, and lay out the land beyond the boundary, so ascertained, into separate and independent states, from time to time, as the numbers and circumstances of the people thereof may require."[30] Maryland alone voted in the affirmative, and the states with claims to western lands succeeded in adding a provision to the Articles of Confederation, "that no State shall be deprived of territory for the benefit of the United States." Maryland, however, refused to ratify the Articles of Confederation until the land claims had been placed on a different basis, and her determined attitude led to cessions to the United States by claimant states of their claims to western territory, with respect both to ownership of the soil and to jurisdiction over the inhabitants.[31]

Early in 1780 New York indicated her willingness to give up her rather vague western claims, and on September 6 of that year the Continental Congress urged all the claimant states to cede their claims to the United States.[32] On October 10 the Congress passed a momentous resolution, for which Madison, then one of the Virginia delegates, was mainly responsible. In this it was declared,

> That the unappropriated lands that may be ceded or relinquished to the United States, by any particular states, pursuant to the recommendation of Congress of the 6 day of September last, shall be disposed of for the common benefit of the United States and be settled and formed into distinct republican states, which shall become members of the federal union, and have the same rights of sovereignty, freedom and independence, as the other states.[33]

What has been called the "pioneer thought" that Maryland had presented in the Continental Congress in 1777—the principle, namely, that the western territory should ultimately be divided into new states, to be admitted into the Union on a footing of equality with the original states—now had the formal approval of the Congress.

The deed by which Virginia finally ceded to the United States her claims to territory northwest of the Ohio River was executed on March 1, 1784, and on that day Jefferson, as chairman of a committee appointed by Congress to prepare a plan for the temporary government of the western territory, presented a report which he had drafted. After undergoing revisions and amendments it was approved by Congress on April 23, 1784, and became an ordinance.[34] It was intended to apply to western territory already ceded or to be ceded by individual states to the United States, after it had been purchased from the Indians and offered for sale by Congress. Such territory was to be divided into "distinct states" by parallels of latitude and meridians of longitude, and for them a temporary territorial regime was to be established. But as soon as any one of them had a free population as large as that of the least populous of the original states, it was to be admitted, by its delegates, to Congress, "on an equal footing with the said original states," provided that the consent of Congress, as required by the Articles of Confederation, were obtained. Though Jefferson's Ordinance did not go into effect, it is always regarded as one of his major state papers, and Jefferson has been called "the man chiefly responsible for the foundation of the first 'colonial policy' of the United States."[35] The Ordinance embodies the principle that he had had in mind for years, at least ever since he wrote his draft of the Virginia Constitution in 1776, namely, that the inhabitants of the west were not to be "held as subject colonists, but were to be given equal rights with the parent state."[36] Certain stipulations were enumerated in a series of articles, and it was declared that these articles should be formed into "a charter of compact" (note the phrase) and should stand as "fundamental constitutions between the thirteen original states and each of the several states now newly described, unalterable . . . but by the joint consent of the United States in Congress assembled, and of the particular state within which such alteration is proposed to be made." As Dumas Malone has put it, Jefferson

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[29] *American Archives,* ed. by Peter Force, 5th ser., 3: 134.

[30] *Journals of the Continental Congress,* ed. by W. C. Ford, 9: 807, 1907.

[31] Maryland's attitude and its results are considered at length in Herbert B. Adams, *Maryland's influence in founding a national commonwealth,* Baltimore, 1877.

[32] *Journals of the Continental Congress,* ed. by Gaillard Hunt, 17: 806–807, 1910.

[33] *Ibid.* 18: 915, 1910.

[34] *Ibid.* 26: 275 ff., 1928.

[35] Merrill Jensen, *The new nation,* 353, N. Y., Knopf, 1950.

[36] *The writings of Thomas Jefferson,* ed. by Paul Leicester Ford, 1: 30, N. Y., Putnam's Sons, 1892.

"had no desire to break from the British Empire only to establish an American—in which the newer region should be subsidiary and tributary to the old. What he dreamed of was an expanding Union of self-governing commonwealths, joined as a group of peers." [37] What principally concerns us in this connection is the fact that Jefferson, before he became an architect of the new American territorial system, had convinced himself, and done his best to convince others, that in the old British imperial system the mother country and the colonies were, by rights, "joined as a group of peers." Is it likely that this opinion had no influence upon him in his vision of the future American empire?

An interesting question has been raised as to a possible source of Jefferson's territorial ideas. In 1775 there was published a second edition of Cartwright's pamphlet to which we have referred, with a Postscript, in which he made proposals for new colonies ("states," as he called them), to be formed within the "Grand British League and Confederacy." He advocated a new definition of colonial boundaries which would reduce many of the colonies to more moderate dimensions, and he thought that the territory beyond their new limits ought to be divided into definite areas, "each of which should be considered as the territory of some future state which in process of time might be therein erected." He proposed that until the number of inhabitants within any such area amounted to 50,000 they should be subject to Great Britain, but that, when they reached that number,

> they should be entitled and free to erect themselves into an independent political state . . . provided only that they acknowledged the king of Great-Britain as their lawful sovereign, that they made the protestant faith the established religion of the country, and consented to become a party to the Great British League and Confederacy.

In addition to the existing British-American "states" (which included Newfoundland, Nova Scotia, the province of Quebec, East Florida, and West Florida, as well as the Thirteen Colonies) Cartwright contemplated the future establishment of at least nineteen new ones, and he indicated on a map what he deemed to be suitable boundaries for them. In an article on Cartwright's plan for new "states," published in 1925,[38] Harold M. Baer pointed out similarities to Cartwright's proposals in the later territorial ordinances passed by the Congress of the Confederation, especially in Jefferson's of 1784. "It would be especially interesting," he said, "to know whether Thomas Jefferson . . . had ever chanced upon Cartwright's plan of 1775." It would, indeed, seem strange if that omniverous reader had missed it, though there appears to have been no copy of this pamphlet of Cartwright's in Jefferson's library. At any rate, later American territorial policy, as Mr. Baer suggested, "might conceivably have had Cartwright's plan as one of its sources." And even if it did not, we are justified in saying that Cartwright's proposal for new "independent" American states was derived from his pluralistic conception of the British Empire.

By 1786 all the states with claims to territory northwest of the Ohio had ceded them to the United States (with the exception of Connecticut's Western Reserve, over which that state did not surrender jurisdiction until 1800), and the way was open to organize this territory as a federal domain. Provision for this purpose was made by the Congress of the Confederation in the document that came to be revered as the Magna Carta of American territorial policy, the Northwest Ordinance of July, 1787. In it arrangements for the temporary government of the territory were followed by a series of articles, to be considered as "articles of compact between the original States and the people and States in the said territory, and forever remain unalterable, unless by common consent." One of these articles provided that there should eventually be formed in the territory not less than three nor more than five states, and that whenever any one of them should reach a population of 60,000 free inhabitants, it should be admitted into the Congress of the United States "on an equal footing with the original States, in all respects whatever."

The Congress of the Confederation, which presumed to enact this Ordinance, enjoyed little respect or authority in its own day, and furthermore it clearly exceeded its legal powers in doing so.[39]

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[37] Dumas Malone, *Jefferson the Virginian*, 412, Boston, Little, Brown, 1948.

[38] An early plan for the development of the west. *Amer. Hist. Rev.* **30**: 537 ff., 1924-25.

[39] Similarly, the Congress that passed the Jefferson Ordinance in 1784 had exceeded its legal powers; see *The papers of Thomas Jefferson*, ed. by Julian P. Boyd, 6: 587-588. Authorities showing the invalidity of the Ordinance of 1787 are cited in Remarks of P. Emory Aldrich on the Ordinance of 1787, *Proc. Amer. Anti-*

The Federal Convention, which was engaged at Philadelphia in drafting a new Constitution for the United States at the time when the Congress of the old Confederation, sitting in New York, was passing the Northwest Ordinance, considered itself at liberty to frame such rules as it might deem fit respecting the territories of the United States and the admission of new states into the Union. As a matter of fact, however, the new Constitution had very little to say on these subjects, and it was silent with regard to the constitutional status of new states. All that it had to say is to be found in the first two paragraphs of Section 3 of Article IV:

> New States may be admitted by the Congress into this Union; but no new State shall be formed or erected within the Jurisdiction of any other State; nor any State be formed by the Junction of two or more States, or Parts of States, without the consent of the Legislatures of the States concerned as well as of the Congress.
>
> The Congress shall have Power to dispose of and make all needful Rules and Regulations respecting the Territory or other Property belonging to the United States; and nothing in this Constitution shall be so construed as to prejudice any Claims of the United States, or of any particular State.

A good deal, however, was said on the subjects in question in the Convention that framed the Constitution, and if the Constitution is studied in the light of the Convention's debates, what may be called its "silences" are sometimes seen to have historical significance.[40] Sometimes they conceal important compromises. It was generally assumed by members of the Convention that new states would come into existence in the west, but there were sharp differences of opinion as to what their constitutional status ought to be.

Gouverneur Morris, one of the Pennsylvania delegates, was the leading advocate of the subordination of new states to the original members of the Union. When the question of the representation of the states in the lower house of the proposed federal legislature was under discussion, he urged that property ought to be taken into account as well as population, and he expressed apprehensions about the growth of the west.[41] As reported in Madison's Notes of the debates in the Federal Convention:

> Mr. Govr. Morris . . . looked forward also to that range of New States which wd. soon be formed in the west. He thought the rule of representation ought to be so fixed as to secure to the Atlantic States a prevalence in the National Councils. The new States will know less of the public interest than these, will have an interest in many respects different, in particular will be little scrupulous of involving the Community in wars the burdens & operations of which would fall chiefly on the maritime States. Provisions ought therefore to be made to prevent the maritime States from being hereafter outvoted by them.[42]

In a later speech Morris predicted that the westerners, even if in time they should outnumber the inhabitants of the Atlantic states, would remain inferior to them in political wisdom:

> The busy haunts of men, not the remote wilderness, was the proper School of political Talents. If the Western people get the power into their hands, they will ruin the Atlantic interests. The Back members are always most averse to the best measures.[43]

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quarian Soc. n.s., 5: 343–347, 1889. In Number 38 of *The Federalist* Madison correctly stated the case: "Congress have undertaken . . . to form new States, to erect temporary governments, to appoint officers for them, and to prescribe the conditions on which such States shall be admitted into the Confederacy. All this has been done; and done without the least color of constitutional authority. . . . The public interest, the necessity of the case, imposed upon them the task of over-leaping their constitutional limits." What placed the Ordinance of 1787 on a legal basis was its re-enactment by the first Congress under the new Constitution in 1789. *The territorial papers of the United States,* ed. by Clarence Edwin Carter, 2: 203–204, Washington, Govt. Print. Off., 1934. For a recent critical, legally erudite, and very elaborate study of the Ordinance of 1787, see Francis S. Philbrick, *op. cit.,* clxxix–ccxlix.

[40] Suggestions and proposals which were made by members of the Convention but not incorporated in the Constitution have been collected by Jane Butzner in a useful compilation entitled *Constitutional chaff: Rejected suggestions of the Constitutional Convention of 1787 with explanatory argument,* N. Y., Columbia Univ. Press, 1941.

[41] This was no new fear on Morris's part. Back in 1778, when he was Secretary for Foreign Affairs under the Continental Congress, he looked with favor upon the policy of Spain regarding the navigation of the Mississippi. "If Spain had the exclusive navigation of the Mississippi," he argued, "the immense population which would form along that river and the Great Lakes could more easily be held in subjection to the East. On the other hand, if this population should hold control of the Mississippi and the St. Lawrence, he expressed the belief that it would soon dominate both the United States and Spain." Paul Chrisler Phillips, *The West in the diplomacy of the American Revolution,* Univ. of Illinois Studies in the Social Sciences, 2: 110, 1913.

[42] *The Records of the Federal Convention of 1787,* ed. by Max Farrand, 1: 533–534, New Haven, Yale Univ. Press, 1911.

[43] *Ibid.* 1: 583.

Nor did Morris stand alone in the Convention in opposing equality for new states. He was chairman of a committee of five members appointed to make recommendations as to the numbers of representatives in the proposed lower house to be assigned to the several states and to provide for future reapportionment. In discussing the report of this committee Nathaniel Gorham of Massachusetts, one of its members, frankly stated that one of the objects in view was to insure that "the Atlantic States, having the Govt. in their own hands, may take care of their own interest, by dealing out the right of Representation in safe proportions to the Western States." Another member of the committee was Rufus King, also of Massachusetts, who was in favor of so limiting the number of representatives assigned to new states that they should never exceed the number of representatives of the original states. King seconded a motion to this effect made by another Massachusetts delegate, Elbridge Gerry, which was narrowly defeated in the Convention by a vote of five states against four, with Pennsylvania divided. Massachusetts, Connecticut, Delaware, and Maryland voted in favor of the motion, with Virginia, North Carolina, South Carolina, Georgia, and New Jersey opposing it.[44] Another member of Morris's committee was John Rutledge of South Carolina, who agreed with the opinion of his chairman that the protection of property was the principal object of society, and that if population alone were made the basis of representation, the Atlantic states would be subjected in the future to new states in the west.[45]

The principle of equality for new states was powerfully championed by George Mason and Madison (both members of the Virginia delegation) and by James Wilson of Pennsylvania. The authentic voice of Revolutionary America spoke in a speech of Mason's. On the basis of the distribution of population then existing, the northern states, he said, were entitled to a preponderance in representation.

> But he wished it [the northern part of the United States] not to preponderate hereafter when the reason no longer continued. . . . . Strong objections had been drawn from the danger to the Atlantic interests from new Western States. Ought we to sacrifice what we know to be right in itself, lest it should prove favorable to States which are not yet in existence. If the Western States are to be admitted into the Union as they arise, they must, he wd. repeat, be treated as equals, and subjected to no degrading discriminations. They will have the same pride & other passions which we have, and will either not unite with or will speedily revolt from the Union, if they are not in all respects placed on an equal footing with their brethren. It has been said they will be poor, and unable to make equal contributions to the general Treasury. He did not know but that in time they would be both more numerous & more wealthy than their Atlantic brethren.[46]

Madison called attention to an inconsistency in Gouverneur Morris's position in urging confidence on the part of the southern states in the northern majority and at the same time "exhorting all to a jealousy of a Western majority."

> To reconcile the gentln. with himself it must be imagined that he determined the human character by the points of the compass. The truth was that all men having power ought to be distrusted to a certain degree. . . . With regard to the Western States, he was clear & firm in opinion that no unfavorable distinctions were admissible either in point of justice or policy.[47]

Especially pertinent to the present thesis is a speech of Wilson's because of the comparison he drew between the western policy advocated by Gouverneur Morris and those who shared his views, on the one hand, and British colonial policy before the Revolution, on the other:

> If a general declaration would satisfy any gentleman, he had no indisposition to declare his sentiments. Conceiving that all men wherever placed have equal rights and are equally entitled to confidence, he viewed without apprehension the period when a few States should contain the superior number of people. The majority of people wherever found ought in all questions to govern the minority. If the interior Country should acquire this majority, they will not only have the right, but will avail themselves of it whether we will or no. This jealousy misled the policy of G. Britain with regard to America. The fatal maxims espoused by her were that the Colonies were growing too fast, and that their growth must be stinted in time. What were the consequences? first enmity on our part, then actual separation. Like consequences will result on the part of the interior settlements, if like jealousy & policy be pursued on ours.[48]

The Convention appointed a Committee of Detail to prepare a draft constitution on the basis of resolutions which had been agreed upon, and in the Committee's report it was provided that new states might be admitted by the federal legislature, and that if so admitted, it should be "on the same terms with the original States."[49] The Committee inserted this stipulation either on its own responsibility or because it interpreted the sense of the Convention in this way, but there was no warrant for doing so in the resolutions referred to it by the Convention.[50] Morris, of course, did not let this pass, and on motion made by him the Convention voted to strike out this provision for equality, and it then agreed, without dissent, to the following simple provision, which left the future constitutional position of new states undetermined and was satisfactory, for the time being at least, both to the equalitarians and the restrictionists: "New States may be admitted by the Legislature into the Union."[51]

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[44] *Ibid.* 2: 3.

[45] *Ibid.* 1: 534.

[46] *Ibid.* 1: 578–579.

[47] *Ibid.* 1: 584.

[48] *Ibid.* 1: 605.

The last committee to participate in the drafting of the Constitution was a Committee of Style, and of this, as it happened, Gouverneur Morris, who had the reputation of wielding a facile pen, was chairman. In the report of this committee the provision for the admission of new states was identical with that contained in the final Constitution: nothing was said about their constitutional status. The most attentive reader of the text of the Constitution would never suspect from the seemingly artless wording of the first paragraph of Section 3 of Article IV that it was significantly silent on a matter of fundamental importance for the future of the United States and one on which sharp difference of opinion had been expressed in the Convention.[52]

The question of the policy to be pursued by the United States with respect to what Washington called "our nascent empire"[53] was one on which the Founding Fathers were not in agreement, either when they were framing the Constitution or afterwards. Sixteen years after the Federal Convention had passed into history, Morris showed that his attitude toward the west had not changed. At the time of the Louisiana Purchase Henry W. Livingston asked him whether he thought Congress could admit a new state in territory which did not belong to the United States when the Constitution was made. Morris replied in a letter dated December 4, 1803, "In my opinion they cannot." He continued:

> I always thought that, when we should acquire Canada and Louisiana it would be proper to govern them as provinces, and allow them no voice in our councils. In wording the third section of the fourth article, I went as far as circumstances would permit to establish the exclusion. Candor obliges me to add my belief, that, had it been more pointedly expressed, a strong opposition would have been made.[54]

And, on the other side, Madison never receded from the position he had taken in the Convention. In a private letter written on November 27, 1819, he said:

> . . . there was a proposition in the convention to discriminate between the old and new States, by an Article in the Constitution declaring that the aggregate number of representatives from the States thereafter to be admitted should never exceed that of the States originally adopting the Constitution. The proposition happily was rejected.[55]

Madison's letter was written at a time when the constitutional position to be held by new states was a major issue of immediate practical politics. The prolonged debates in Congress on questions involved in the admission of Missouri began early in 1819 and stretched over a period of two years. The story is well known. Opponents of slavery were in favor of imposing a restriction on the proposed new state that would have outlawed slavery there, and the anti-restrictionists took the position that such a requirement was inconsistent with equality of statehood, which, they argued, was an essential principle of the American federal system. It was agreed on both sides that Congress had the constitutional right either to admit, or to refuse to admit, a new state. The restrictionists reasoned that therefore Congress could admit on conditions. The anti-restrictionists held that this was not a valid inference. Congress could admit or refuse to admit, but, they argued, it could not impose conditions on a new state which the Constitution did not impose on the old states, for if it could do so, it would be able to reduce new states to the level of subordinate provinces.

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[49] *Ibid.* 2: 188.

[50] Max Farrand, *The framing of the Constitution of the United States,* 132, 143, New Haven, Yale Univ. Press, 1930.

[51] *The Records of the Federal Convention of 1787,* ed. by Max Farrand, 2: 454. Max Farrand, *op. cit.,* 143–144.

[52] Speaking of Morris's work as chairman of the Committee of Style, Farrand says (*The framing of the Constitution of the United States,* 181–182): "A careful comparison of the draft reported by the committee of style with the proceedings of the convention [which had been referred to that committee] would lead one to think that no undue liberties had been taken, and yet just a little suspicion attaches to the work of Morris in preparing this last draft of the constitution. It is partly due to intimations that he himself gave, as in the case . . . with regard to the admission of new states. . . ."

[53] This phrase occurs in a letter of August 29, 1788, quoted in part by Murray G. Lawson in Canada and the Articles of Confederation, *Amer. Hist. Rev.* 58: 53, 1952–53.

[54] *The records of the Federal Convention of 1787,* ed. by Max Farrand, 3: 404.

[55] *The writings of James Madison,* ed. by Gaillard Hunt, 9: 7, 1910.

Perhaps the most famous speech in the course of the Missouri debates in Congress was delivered by Senator William Pinkney of Maryland. The power of Congress in the premises, he pointed out, was to admit new states into "this Union." But, he asked, what was "this Union?" It was, in his words, "A confederation of States, equal in sovereignty, capable of everything which the Constitution does not forbid, or authorize Congress to forbid."

> It is an equal union between parties equally sovereign. . . . It is into *that* Union that a new State is to come. By acceding to it, the new State is placed on the same footing with the original States. . . . If it comes in shorn of its beams, crippled and disparaged beyond the original States, it is not into the original Union that it comes. For it is a different sort of Union. The first was a Union *inter pares.* This is a Union *inter disparates,* between giants and a dwarf, between power and feebleness, between full proportioned sovereignties and a miserable image of power. . . . You cannot make the Union, as to the new States, what it is not as to the old; for then it is not *this* Union that you open for the entrance of a new party. . . . You may admit or refuse to admit. but if you admit, you must admit a State in the sense of the Constitution—a State with all such sovereignty as belongs to the original parties.[56]

Such arguments were successful, and when Missouri was admitted as a state of the Union it was without restrictions. One of the results of this great controversy, as summarized by John W. Burgess, was that it taught the inhabitants of the older states

> that the West could not be held in a provincial or quasi-provincial status; that it must be carved up and formed into Commonwealths having the same powers and privileges as the older Commonwealths; and that, therefore. the political centre of the United States was bound to move westward, and the East was ultimately to come, in large degree, under the influence of the West.[57]

As a matter of fact, however, a large majority of the states that have been admitted to the Union were subjected by Congress to various conditions which ostensibly limited their powers as states after admission.[58] Writing two generations ago, William Archibald Dunning reached the conclusion that "at no time since the formation of the present constitution have all the states of the Union been in the enjoyment of equal powers under the laws of Congress." [59] The doctrine of state equality in our constitutional system, he said, had not been decisively affirmed by the judiciary or the executive, and legislative action had in many cases been in contradiction of it. He went on to remark, however, that "whatever differences may exist in the powers which the states *may* exercise over different subjects, the powers which they *do* exercise are everywhere substantially the same." The legal question is whether the conditions ostensibly imposed by Congress on new states have been legally valid and binding. "The Father of the Constitution" certainly deserves to be heard on this question. In the letter from which we have already quoted Madison wrote:

> As to the power of admitting new States into the federal compact, the questions offering themselves are; whether congress can attach conditions, or the new States concur in conditions, which after admission, would abridge or *enlarge* the constitutional rights of legislation common to the other States; whether Congress can by a compact with a new member take power either to or from itself, or place the new member above or below the equal rank & rights possessed by the others; whether all such stipulations, expressed or implied, would not be nullities, and so pronounced when brought to a practical test.[60]

The questions posed by Madison at length received authoritative judicial decision by the Supreme Court in 1910. In Coyle *v.* Smith, Secretary of State of the State of Oklahoma,[61] in which the Court reviewed the precedents, it said, in words that seem to echo Senator Pinkney's great speech:

> The power of Congress in respect to the admission of new States is found in the third section of the

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[56] For Senator Pinkney's speech, see *Annals of the Congress of the United States,* Sixteenth Congress, 1st Session, col. 389 ff.

[57] John W. Burgess, *The middle period,* 105, N. Y., Scribner's, 1901.

[58] For the nature of these conditions, see Philbrick, *op. cit.,* clxi–clxii.

[59] In an essay entitled Are the States Equal under the Constitution? *Essays on the Civil War and Reconstruction,* 304 ff., N. Y., 1898.

[60] *The writings of James Madison,* ed. by Gaillard Hunt, 9: 6–7.

[61] 221 U. S. Reports, 559 ff.

> fourth Article of the Constitution. . . . But what is this power? It is not to admit political organizations which are less or greater, or different in dignity or power, from those political entities which constitute the Union. . . . The power is to admit "new States into *this* Union." "This Union" was and is a union of States, equal in power, dignity and authority, each competent to exert that residuum of sovereignty not delegated to the United States by the Constitution itself. To maintain otherwise would be to say that the Union, through the power of Congress to admit new States, might come to be a union of States unequal in power, as including States whose powers were restricted only by the Constitution, with others whose powers had been further restricted by an act of Congress accepted as a condition of admission . . . the constitutional equality of the States is essential to the harmonious operation of the scheme upon which the Republic was organized. When that equality disappears . . . the Union will not be the Union of the Constitution.

The territorial system of the United States, conceived and framed in our Revolutionary era, was a colonial system of a new type, in which provision was made for its own termination. Dependencies were not to be held permanently as such. As soon as conditions warranted, they were to be formed into states and admitted to the federal union known as the United States of America as equal partners of the original states. In a letter to Jefferson, written in May, 1786, James Monroe referred to the plan for the government of the Northwest Territory which was then before the Congress of the Confederation, of which he was a member. He said:

> It is in effect to be a colonial gov'nt similar to that wh. prevailed in these States previous to the revolution, with this remarkable and important difference that when such districts shall contain the number of the least numerous of the "thirteen original States for the time being" they shall be admitted into the confederacy.[62]

How is "this remarkable and important difference," this constitutional innovation admittedly of profound historical significance, to be accounted for?

A comprehensive answer to this question would involve a thorough-going study of the climate of opinion in Revolutionary America. No doubt the Revolutionary political and social philosophy in general, with its emphasis on the principle of equality, was a powerful conditioning factor; and, also no doubt, colonial experiences taught some Americans how colonies ought not to be governed. But there was, it is submitted, something more definite than this in the back of the minds of the men who took the lead in founding our territorial system. They were, we must remember, men deeply imbued with a belief in the Rights of Man, based upon the Law of Nature and derived ultimately from the Will of God. But they were also —until 1776—citizens of an Empire whose constitutional structure they had tried to reconcile with their Revolutionary philosophy. In that Empire, so they claimed, the colonies were—by immutable laws of nature, by the true principles of what they called the English Constitution, and by provisions of colonial charters, which they regarded as compacts between the English crown and the colonists—on a footing of constitutional equality with Great Britain. That Empire, by rights, did not consist of a politically dominant mother country and a group of colonial dependencies. On the contrary, it was an association of constitutionally equal states. With what consistency, with what integrity, with what conscience, could men who had committed themselves to such a view of the British Empire, to such a view of the constitutional status of their own communities within that Empire, proceed to establish an imperial system of their own based upon the principle of permanent inequality?[63]

It would be unhistorical and extravagant to claim that the conception of the British Empire in the minds of American Revolutionists was the only cause, or even the fundamental cause, of the most distinctive and significant feature of our territorial system. "Fundamental causes" are, I believe, fundamentally objectionable in historiography. The thesis here presented is merely this —that the Pluralistic Theory of the British Empire had an influence upon the framers of American territorial policy that has not been recognized.

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[62] *Letters of members of the Continental Congress*, ed. by Edmund C. Burnett, 8: 360, Washington, Carnegie Inst., 1936.

[63] In a stimulating article on American foreign policy, recently published (The balance of power versus the coördinate state, *Polit. Sci. Quart.* 67: 173–197, 1952), Professor Frank Tannenbaum emphasizes an affinity between the principle of equality of statehood in our federal union and the concept, traditional in our foreign policy, of equality among the sovereign states of the world. He believes that if the American people should abandon this concept, it would mean disaster for the world and would also "convert the United States from a federal republic to an empire and ultimately destroy the republic."

DOMESTIC PRODUCTION AND FOREIGN TRADE; THE AMERICAN CAPITAL POSITION RE-EXAMINED [1]

WASSILY LEONTIEF

Professor of Economics, Director of the Harvard Economic Research Project, Harvard University

(Read April 24, 1953)

> "A fin d'être absolument clair dans nos recettes, nous n'avons pas craint de répéter plusieurs fois un même mot dans une phrase. Nos lecteur nous seuront gré d'avoir évité les recherches de style dans un ouvrage qui n'en comporte pas."
>
> French Cookbook by Tante Marie

I. THE STRUCTURAL BASIS OF INTERNATIONAL TRADE

COUNTRIES trade with each other because this enables them to participate in and to profit from the international division of labor. Not unlike businesses and individuals, each area specializes in those lines of economic activity to which it happens to be best suited and then trades some of its own outputs for commodities and services in the production of which other countries have a comparative advantage. The word comparative is in this connection of particular significance.

The United States, for example, exports automobiles and imports newsprint. It does so because the quantity of Canadian paper which we can obtain in exchange for, say, a million dollars' worth of American cars is larger than the additional amount of newsprint which we would be able to produce at home if we withdrew the capital, labor, and other resources now absorbed in the manufacture of one million dollars' worth of automobiles and used it instead to increase the output of our domestic paper industry. Canada, for analogous but in a sense opposite reasons, finds it advantageous to obtain its automobiles from the United States in exchange for newsprint rather than to divert resources from their present employment in its paper industry into an increased domestic production of cars.

This explanation of the international exchange of goods and services in terms of the comparative advantage of the alternative allocation of resources in each of the trading countries, was originally developed in the writings of David Ricardo and other so-called classical economists of the late eighteenth and the early nineteenth centuries. It still constitutes the basis of the modern theory of international trade. The theory of comparative costs—as many other economic theories—reigns, however, in the pages of college text books without actually governing the practice of empirical economic analysis.

Until recently, we had so little systematic knowledge of the productive structure of our own or of any other national economy that the application of such general theoretical principles to the analysis and explanation of actual foreign trade relationships has been practically out of the question. Most of what has been said on that subject consisted of reasonable common sense conjectures or of plausible examples which—like the automobile and newsprint reference used above—serves well enough to illustrate the logic of the theoretical argument, but had hardly any specific base in detailed facts and figures.[2]

A widely shared view on the nature of the trade between the United States and the rest of the world is derived from what appears to be a common sense assumption that this country has a comparative advantage in the production of commodities which require for their manufacture large quantities of capital and relatively small amounts of labor. Our economic relationships with other countries are supposed to be based mainly on the export of such "capital intensive" goods in exchange for foreign products which—if we were to make them at home—would require little capital but large quantities of American labor. Since the United States possesses a relatively large amount of capital—so goes this oft repeated argument—and a comparatively small amount of labor, direct domestic production of such "labor intensive" products would be uneconomical; we can much more advantageously obtain them from abroad in exchange for our capital intensive products.

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[1] The study described in this paper constitutes a part of the systematic analysis of *The Structure of the American Economy* conducted by the Harvard Economic Research Project. Miss Sue Smulekoff, assisted by Mrs. Nancy Bromberger, has prepared the statistical tables presented in this paper and performed the numerical computations underlying these tables.

[2] As an example of the recent empirical studies in that field, see Macdougall, G. D. A., British and American export: a study suggested by the theory of comparative costs, *Econ. Jour.* **61** (1): 697–724, 1951; also, Macdougall, G. D. A., British and American exports: a study suggested by the theory of comparative costs, *Econ. Jour.* **62** (2): 487–522, 1952. A succinct discussion of the theoretical problems involved can be found in Samuelson, P. A. International trade and the equalization of factor prices, *Econ. Jour.* **58**: 163–184, 1948; and International factor price equalization once again, *Econ. Jour.* **59**: 180–197, 1949.

Recent progress in the collection and systematic organization of detailed quantitative information on the structure of all the various branches of the American economy, accompanied by a parallel advance in the technique of large scale numerical computation, now enables us to narrow the frustrating gap between theory and observation.[3]

This is the first preliminary progress report on a study designed to analyze the structural basis of trade relationships between the United States and the rest of the world.

II. DIRECT AND INDIRECT INPUT REQUIREMENTS

None of the basic factual information used here had to be collected especially for this particular inquiry. Both the statistical data and the analytical procedure employed constitute an integral part of the so-called input-output or inter-industry research program jointly conducted by various agencies of the government and private institutions, of which the Harvard Economic Research Project is one.

The factual information referred to above comprises many sets of figures of which the largest and in a sense the most important is organized in terms of a so-called input-output table.[4] This table describes the actual flow of commodities and services among all the different parts of the American economy. Specifically, it shows how each one of our manufacturing industries, each branch of agriculture, each kind of transportation and distribution—in short each sector of the American economy—depends upon every other sector. A single column of an input-output table, shows, for example, how many steel sheets, steel bars, and other steel products automobile manufacturers buy from the steel industry for every million dollars' worth of cars they produce; it also shows how many yards (or dollars' worth) they need of upholstery material, how much paint from the chemical industry and so on. Similarly, the "steel industry column" of the same table describes the various kinds of inputs, such as, coal, ore, etc., which the steel industry must obtain from the other sectors of the economy in order to produce an additional million dollars' worth of its own output which, of course, consists of various steel products. The table contains as many columns as there are separate industries so that it presents each link connecting any two sections of the economy.

On the basis of the statistical information contained in an input-output table one can determine the effect of any given increase or decrease in the level of output in any one sector of the economy upon the rate of production in all the other sectors.

Using the 1947 input-output structure of the American economy as the basis of such computations, one finds that to produce an additional million dollars' worth of automobiles the output of steel would have to increase by 235 thousand dollars, the output of chemicals by 58 thousand dollars, while raising the production of non-ferrous metals by 79, of textiles by 39 thousand dollars and so on. Even the communication services—telephone and telegraph—would have to contribute indirectly to the production of a million dollars' worth of additional automobiles.

Column 2 in our table 1 shows the result of this particular computation. Without entering into the discussion of technical details it may be sufficient to observe that the magnitude of every one of the entries depends upon all the input-output relationships among all the sectors of the economy, and that the computation of each one of these figures is equivalent to the solution of a system of as many simultaneous equations as there are distinct sectors in the economy.

The more minute the breakdown of industries in the basic input-output table, the more detailed the final results will be. The following analysis is based on a 200 industry breakdown consolidated in some of its stages—for purposes of computation and simplified presentation—into fifty sectors (38

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[3] For description of the so-called input-output approach to structural economic analysis, see Leontief, Wassily, and members of the Harvard Economic Research Project, *Studies in the structure of the American Economy,* N. Y., Oxford Univ. Press, 1952.

[4] Evans, W. Duane, and Marvin Hoffenberg, The inter-industry relations study for 1947, *Rev. of Economics and Statistics* 34: 97-142, 1952.

TABLE 1

Capital and Labor Requirements for the Final Output of One Million Dollars' Worth of Motor Vehicles

Industry[a]	Output requirements[b]	Requirements per million dollars of output of industry listed on left		Requirements per million dollars of final output of motor vehicles	
		Capital	Labor	Capital	Labor
1	2	3	4	5	6
	(Thousands of dollars)	(Thousands of dollars)	(Man years)	(Thousands of dollars)	(Man years)
26. Motor vehicles (145)	1,457.45[c]	565.8	60.340	824.6	87.942
15. Iron and steel	235.14	1,026.3	77.777	241.3	18.288
19. Other fabricated metal products	118.25	713.5	95.335	84.5	11.273
16. Nonferrous metals	78.69	1,001.6	55.715	78.8	4.384
25. Other electrical machinery	75.50	551.1	102.638	41.6	7.749
22. Other non-electric machinery	60.70	775.7	96.579	47.1	5.862
10. Chemicals	57.95	592.7	49.779	34.3	2.885
12. Rubber products	56.19	493.1	90.172	27.7	5.067
31. Railroad transportation	50.18	3,343.3	153.640	167.8	7.710
11. Products of petroleum and coal	46.85	1,397.2	29.843	65.5	1.398
4. Textile mill products	39.29	493.6	110.563	19.4	4.344
14. Stone, clay and glass products	33.64	1,026.3	128.539	34.5	4.324
8. Paper and allied products	31.95	564.1	64.805	18.0	2.071
34. Trade	31.82	984.9	165.876	31.3	5.278
30. Coal, gas and electric power	29.50	2,222.6	99.318	65.6	2.930
1. Agriculture and fisheries	27.53	2,524.4	82.025	69.5	2.258
21. Metalworking machinery	27.48	1,246.9	130.705	34.3	3.592
33. Other transportation	23.88	928.3	121.576	22.2	2.903
9. Printing and publishing	19.72	436.0	114.038	8.6	2.249
38. Business services	18.44	144.5	97.543	2.7	1.799
39. Personal and repair services	18.10	681.8	183.503	12.3	3.321
6. Lumber and wood products	15.98	537.9	141.540	8.6	2.262
5. Apparel	13.74	262.2	108.795	3.6	1.495
29. Miscellaneous manufacturing	11.26	439.4	100.364	4.9	1.130
37. Rental	10.68	8,156.5	16.324	87.1	.174
28. Professional and scientific equipment	10.35	841.8	133.129	8.7	1.378
2. Food and kindred products	9.98	361.9	43.143	3.6	.431
36. Finance and insurance	9.83	28.2	92.242	.3	.907
35. Communications	6.21	4,645.4	163.097	28.8	1.013
44. Eating and drinking places	6.02	688.0	125.365	4.1	.755
27. Other transportation equipment	5.11	759.0	122.419	3.9	.626
13. Leather and leather products	5.06	264.0	109.629	1.3	.555
23. Motors and generators	4.99	404.3	117.771	2.0	.588
24. Radios	4.65	449.0	124.097	2.1	.577
7. Furniture and fixtures	4.28	485.1	116.923	2.1	.500
18. Fabricated structural metal products	3.79	441.9	83.300	1.7	.316
20. Agriculture, mining and construction machinery	3.65	838.6	87.794	3.1	.320
17. Plumbing and heating supplies	2.67	509.9	99.388	1.4	.265
40. Medical, educational and non-profit org's.	2.05	2,689.5	253.044	5.5	.519
3. Tobacco manufactures	.53	557.6	40.539	.3	.021
41. Amusements	.10	1,082.9	166.899	.1	.017
Total requirements in all industries per million dollars of final output of motor vehicles				2,104.8	201.476

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[a] See footnote b for table 2.

[b] The output required from each industry in order to produce one million dollars' worth of motor vehicles for export or domestic consumption. See Evans and Hoffenberg, "The Interindustry Relations Study for 1947," *The Review of Economics and Statistics* **34**: Table 6, 1952.

[c] This figure includes the "back feed" within this industry, i.e., the automotive industry's purchases from itself, as well as the million dollars' worth of motor vehicles going to final consumers and the amounts needed by the various other industries to meet their output requirements. For detailed explanation of the technical point involved, see, Evans, W. Duane and Marvin Hoffenberg, *loc. cit.*, 137 and 140.

of which trade their products directly on the international market).

III. CAPITAL AND LABOR INPUTS

The second and the third sets of our statistical data (columns 3 and 4, table 1) show the direct capital and labor requirements of each industry. These figures are based on detailed information which tells us, for example, that to produce an additional million dollars' worth of finished cars, our automobile industry would have to invest in 175 thousand dollars' worth of new buildings, 266 thousand of additional machinery and many other fixed items. It also would have to increase its inventories of raw materials and "goods in process" by 124 thousand dollars. All together this adds up to 566 thousand dollars which represent the total additional capital (in 1947 prices) which would have to be invested in the American automobile industry if its capacity were raised so as to enable us to produce an additional million dollars' worth of cars per year.

But this is only one part of the total additional capital which would have to be invested in the American economy in order to enable it to produce—say, for export purposes—these additional automobiles. As we saw before, the input of steel into the automobile industry will have to increase by 235 thousand dollars and the input of textile by 39 thousand. This, of course, means additional investment in both the steel and textile industries. The magnitude of each of these capital requirements can be computed. To do so one must simply multiply the amount of capital which each of these two industries requires per million dollars of its capacity by the additional demand for its product indirectly generated by the million dollar rise in automobile output. The amounts of additional capital which each one of the various sectors of the economy would need in order to enable the United States to increase its automobile export by one million dollars are listed in column 5 of table 1. These add up to 2,105 thousand dollars which is the total amount of capital which the United States economy of 1947 had to invest for every million dollars' worth of cars produced for export or final domestic use.

Like the top of an iceberg, visible above the surface of the water, the part invested in the automobile industry itself constitutes only a small portion of the total—26 per cent to be exact; the rest is distributed among the other 42 productive sectors of the economy. Similar computations have been performed for each category of commodities and services which we export or import (in competition with domestic output).

Labor is the other primary factor, the availability of which must obviously have a decisive role in establishing the pattern of specialization which determines the composition of our foreign trade. Not unlike capital, the man years which go into the production of, say, one million dollars' worth of automobiles are partly absorbed by the automobile industry itself but are partly employed also by all the other sectors of the economy. The computation of such direct and indirect labor requirements is quite analogous to the computation of the direct and indirect demand for capital (see columns 3 and 5, table 1).

The summary of total quantities of capital and labor required for domestic production of each of the many types of commodities exported and imported by the United States is entered in columns 2 and 3, table 2. In this table most of the 38 large industry and commodity groups are broken down into their components, described in terms of the more detailed 200 industry input-output classification.

The figures entered in columns 2 and 3 were actually arrived at in two steps. First the indirect capital and labor requirements generated by one million dollars' worth of demand for the product of each of the composite 38 sectors were computed. This computation (essentially a solution of corresponding systems of linear equations) was performed in terms of the consolidated 50 industry input-output table. Next, the *total* capital and labor requirements respectively of each *particular* commodity type within the sector were obtained by adding its *specific direct* requirements to the previously computed (in a sense average) *indirect* requirements of the consolidated sector as a whole. Thus, the differences between the total capital and labor requirements of the industrial products belonging to the same consolidated sector are due entirely to the difference in their *direct* requirements, since their *indirect* requirements are assumed to be the same.

The main reason for such a two-stage procedure is economic. If based throughout on the 200 × 200 input-output table the computation of direct and indirect requirements would cost a thousand dollars more. The errors caused by the short cut are not likely to be of decisive importance since

TABLE 2

CAPITAL AND LABOR REQUIREMENTS PER MILLION DOLLARS OF U. S. EXPORTS AND IMPORT REPLACEMENTS[a]
1947

Industry[b]	Direct and indirect requirements per million dollars of final output		Exports per million dollars of total exports[e]	Imports per million dollars of total imports[f]	Requirements per million dollars of exports and import replacements of average (1947) composition				Comparison of export and imports requirements[g]	
	Capital[c]	Labor[d]			Capital		Labor			
					Exports	Import replace.	Exports	Import. replace.	Cap.	Lab.
1	2	3	4	5	6	7	8	9	10	11
	(Millions of dollars)	(Man years)	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Man years)	(Man years)		
All industries			1,000,000	1,000,000	2,550,780	3,091,339	182.313	170.004	≤	≥
1. Agriculture and fisheries (1–10a)	4.7120	158.710	100,987	257,526	475,851	1,213,463	16.028	40.872		
2. Food and kindred products			105,701	98,045	*3,119,593*[h]	*3,349,589*	*159.847*	*183.508*	<	<
Meat packing and poultry (21)	3.0158	149.032	17,568	7,189	52,982	21,681	2.618	1.071		
Processed dairy products (22)	3.1334	165.081	15,217	2,429	47,681	7,611	2.512	.401		
Canning, preserving and freezing (23)	3.2287	206.505	11,446	48,043	36,956	155.116	2.364	9.921		
Grain mill products (24)	3.0375	146.371	45,928	1,522	139,506	4,623	6.723	.223		
Bakery products (25)	3.2447	221.331	468	32	1,519	104	.104	.007		
Miscellaneous food products (26)	3.2610	175.271	10,553	8,825	34,413	28,778	1.850	1.547		
Sugar (27)	4.1953	148.850	1,997	12,970	8,378	54,413	.297	1.931		
Alcoholic beverages (28)	3.2923	169.712	2,524	17,035	8,310	56,084	.428	2.891		
3. Tobacco manufactures (29)	3.2887	173.472	13,245	21,439	43,559	70,506	2.298	3.719		
4. Textile mill products			56,810	23,657	*2,308,032*	*2,327,539*	*213.202*	*206.662*	≤	>
Spinning, weaving and dyeing (30)	2.3114	215.250	53,758	9,796	124,256	22,643	11.571	2.109		
Special textile products (31)	2.3420	201.558	684	8,922	1,602	20,895	.138	1.798		
Jute, linen, cordage and twine (32)	2.3412	200.639	815	4,728	1,908	11,069	.164	.949		
Floor coverings (35a)	2.1591	154.206	1,553	211	3,353	456	.239	.033		
5. Apparel			21,129	36,029	*1,661,527*	*2,213,875*	*233.802*	*207.139*	<	>
Canvas products (33)	1.6106	237.848	174	0	280	0	.041	0		
Apparel except furs (34)	1.6050	250.169	15,493	12,630	24,866	20,271	3.876	3.160		
House furnishings, etc. (35b)	1.6492	188.151	4,479	1,814	7,387	2,992	.843	.341		
Furs (hunting and trapping) (10b)	2.6176	183.571	983	21,585	2,573	56,501	.180	3.962		
6. Lumber and wood products			10,223	31,787	*1,560,785*	*1,617,910*	*242.003*	*231.636*	<	>
Logging (36)	1.6383	188.365	378	9,149	619	14,989	.071	1.723		
Sawmills, planing and veneer mills (37)	1.6383	251.604	7,153	20,435	11,719	33,479	1.800	5.142		
Plywood (38)	1.3366	209.125	863	761	1,154	1,017	.180	.159		
Fabricated wood products (39)	1.3465	226.188	1,217	632	1,639	851	.275	.143		
Wood containers and cooperage (40)	1.3491	242.168	612	810	826	1,093	.148	.196		
7. Furniture and fixtures (41–43)	1.6821	233.687	2,075	437	3,490	735	.485	.102		

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[a] All figures refer to 1947.

[b] The thirty-eight composite industries are found in Evans, W. Duane, and Hoffenberg, Marvin, "The Interindustry Relations Study for 1947," *The Review of Economics and Statistics* 34: 97–142, 1952. The component industries are based on Bureau of Labor Statistics, Division of Interindustry Economics, *Interindustry Relations Study, 1947 Emergency model classification;* 1–25, 1952. In column 1, the numbers in parentheses correspond to this latter classification.

Some of the 200-order industries were split in the process of aggregating them into the 50-order classification. These industries are indicated by *a* or *b* following the 200-order industry number. Their composition in terms of the Standard Industrial Classification is as follows:

200-order industry	SIC No.
10a Fisheries	091
10b Hunting and trapping	0741
35a Floor coverings	2274, 2295
35b House furnishings, etc.	2391–2399
100a Boiler shop products	3443
100b Fabricated pipe	3592
112a Tractors	3521
112b Industrial trucks	3565
135a Electrical appliances	3621
135b Heating appliances	3581, 3583, 3584, 3589
186a Radio broadcasting	771
186b Advertising	731

[c] The derivation of these figures is given in the text (see page 335). The basic data on the direct capital requirements (capital coefficients) of individual industries were computed by the Harvard Economic Research Project. For a general description of methods, see Leontief, Wassily, and members of the Harvard Economic Research Project, *Studies in the Structure of the American Economy*, Chapter 6, New York, Oxford University Press, 1952.

[d] See text, page 335, for the derivation of these figures. The direct labor requirements (labor coefficients) were computed by the Harvard Economic Research Project from B. L. S. and census data.

[e] Export figures are based on Bureau of Labor Statistics, Division of Interindustry Economics, Table I—Interindustry flow of goods and services by industry of origin and destination, section 6, October 1952. Exports are valued at producers' value: transportation, insurance and trade margins are charged separately as export items. The total value of exports in 1947 was $16,678.4 million; the actual value of the exports of each industry can be obtained by multiplying each item in column 4 by $16,678.4.

[f] Import figures are based on Bureau of Labor Statistics, *op.cit.* All import figures refer to competitive imports only. Imports are valued at domestic port value, i.e., foreign port value plus transportation, insurance, etc., plus duties. The total value of competitive imports in 1947 was $6,175.7 million; column 5 times $6,175.7 gives the actual value of each type of competitive import.

[g] The sign ">" indicates that the export requirement exceeds the corresponding requirements for import replacement; "<" shows the opposite. The signs "≥" and "≤" mark differences amounting to less than 2 per cent of the larger of the two italicized figures.

[h] For the meaning of the italicized figures, see page 347 in text.

[i] These two industries are numbered 38 and 41, respectively, in Table 1. They are numbered consecutively here because the intervening industries do not directly participate in international trade.

[j] Both the capital and labor coefficients for "Other nonferrous mining" (15) must be considered unreliable (too high) since they were based on output statistics which probably did not include operations performed under the authority of the Atomic Energy Commission.

TABLE 2—*Continued*

Industry[b]	Direct and indirect requirements per million dollars of final output		Exports per million dollars of total exports[e]	Imports per million dollars of total imports[f]	Requirements per million dollars of exports and import replacements of average (1947) composition				Comparison of export and imports requirements[g]	
					Capital		Labor			
	Capital[c]	Labor[d]			Exports	Import replace.	Exports	Import. replace.	Cap.	Lab.
1	2	3	4	5	6	7	8	9	10	11
	(Millions of dollars)	(Man years)	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Man years)	(Man years)		
8. Paper and allied products			9,743	103,616	*1,726,891*	*1,859,722*	*165.764*	*161.346*	<	>
Pulp mills (44)	1.8611	152.803	1,337	42,732	2,488	79,529	.204	6.530		
Paper and paper board mills (45)	1.8611	167.325	4,401	60,447	8,191	112,498	.736	10.114		
Converted paper products (46)	1.5346	169.389	4,005	437	6,146	671	.678	.074		
9. Printing and publishing (47)	1.3216	196.597	4,329	1,425	5,721	1,883	.851	.280		
10. Chemicals			49,153	105,398	*2,337,851*	*2,390,120*	*167.681*	*147.602*	<	>
Industrial inorganic chemicals (48)	2.2968	171.293	7,693	9,748	17,669	22,389	1.318	1.670		
Industrial organic chemicals (49)	2.8055	161.081	7,303	4,340	20,489	12,176	1.176	.699		
Plastic materials (50)	2.5614	159.740	3,082	97	7,894	249	.492	.015		
Rubber (51)	2.5208	141.238	342	55,751	862	140,537	.048	7.874		
Synthetic fiber (52)	2.9200	212.841	1,739	2,720	5,078	7,942	.370	.579		
Explosives (53)	2.2814	197.963	342	0	780	0	.068	0		
Drugs and medicines (54)	2.1666	184.150	9,329	1,457	20,212	3,157	1.718	.268		
Soap and related products (55)	2.1417	146.365	2,524	405	5,406	867	.369	.059		
Paints and allied products (56)	2.0430	152.411	3,663	340	7,484	695	.558	.052		
Gum and wood chemicals (57)	2.4267	184.907	2,140	3,854	5,193	9,353	.396	.713		
Fertilizers (58)	2.3700	180.631	450	356	1,067	844	.081	.064		
Vegetable oils (59)	2.0071	128.889	2,734	20,063	5,487	40,268	.352	2.586		
Animal oils (60)	2.0062	136.738	1,079	2,672	2,165	5,361	.148	.365		
Miscellaneous chemical industries (61)	2.2467	170.497	6,733	3,595	15,127	8,077	1.148	.613		
11a. Crude petroleum and natural gas (17)	3.2118	108.844	6,248	37,372	20,067	120,031	.680	4.068		
11b. Products of petroleum and coal			34,566	21,730	*2,600,946*	*2,674,929*	*94.110*	*93.465*	<	>
Petroleum products (62)	2.5514	94.011	32,881	19,658	83,893	50,155	3.091	1.848		
Coke and products (63)	3.8708	87.760	1,355	2,040	5,245	7,896	.119	.179		
Paving and roofing materials (64)	2.3237	131.557	330	32	767	74	.043	.004		
12. Rubber products			10,199	389	*1,817,051*	*1,801,799*	*194.823*	*205.656*	≥	<
Tires and inner tubes (65)	1.8305	185.087	6,044	49	11,064	90	1.119	.009		
Miscellaneous rubber products (66)	1.7975	208.989	4,155	340	7,469	611	.868	.071		
13. Leather and leather products			5,054	5,974	*1,667,016*	*1,668,681*	*233.874*	*227.151*	≤	>
Tanning and finishing (67)	1.6900	183.095	1,901	2,817	3,213	4,761	.348	.516		
Other leather products (68)	1.6395	271.302	749	1,360	1,228	2,230	.203	.369		
Nonrubber footwear (69)	1.6574	262.612	2,404	1,797	3,984	2,978	.631	.472		
14. Stone, clay and glass products			12,788	27,560	*1,961,425*	*2,345,091*	*192.211*	*177.794*	<	>
Stone, sand, clay and abrasives (18)	2.5821	226.822	330	3,854	852	9,951	.075	.874		
Sulphur (19)	2.5821	139.703	1,385	0	3,576	0	.193	0		
Other nonmetallic minerals (20)	2.5821	154.790	881	17,456	2,275	45,073	.136	2.702		
Glass (70)	1.9293	199.932	4,419	1,295	8,526	2,498	.883	.259		
Cement (71)	2.4944	167.940	1,043	0	2,602	0	.175	0		
Structural clay products (72)	1.7718	271.334	959	49	1,699	87	.260	.013		
Pottery and related products (73)	1.3682	261.934	929	2,477	1,271	3,389	.243	.649		
Concrete and plaster products (74)	1.6727	205.466	246	65	412	109	.051	.013		
Abrasive products (75)	1.4890	159.882	1,127	1,765	1,678	2,628	.180	.282		
Asbestos products (76)	1.4890	176.167	600	32	893	48	.106	.006		
Other miscellaneous nonmetallic minerals (77)	1.4948	179.324	869	567	1,299	848	.156	.102		
15a. Iron ore mining (11)	3.1683	212.434	552	7,675	1,749	24,317	.117	1.630		
15b. Iron and steel			37,732	4,695	*2,724,880*	*2,655,654*	*181.305*	*151.438*	>	>
Blast furnaces (78)	2.6394	142.525	396	3,676	1,045	9,702	.056	.524		
Steel works and rolling mills (79)	2.7599	180.703	35,585	955	98,211	2,636	6.430	.173		
Iron foundries (80)	2.0344	232.540	672	32	1,367	65	.156	.007		
Steel foundries (81)	2.0349	236.564	90	16	183	33	.021	.004		
Iron and steel forgings (92)	2.0311	179.672	989	16	2,009	33	.178	.003		
16a. Nonferrous metal mining			468	47,154	*4,402,991*	*4,372,254*	*286.325*	*281.885*	≥	≥
Copper mining (12)	3.2280	197.862	0	5,263	0	16,989	0	1.041		
Lead and zinc mining (13)	2.6210	230.618	12	5,360	32	14,049	.003	1.236		
Bauxite mining (14)	2.6948	221.395	114	3,757	307	10,124	.025	.832		
Other nonferrous mining (15)[j]	5.0347	310.689	342	32,774	1,722	165,007	.106	10.183		
16b. Processing nonferrous metals			9,516	57,759	*2,402,427*	*2,445,386*	*149.222*	*127.461*	≤	>
Primary copper (82)	2.4334	121.184	2,788	22,216	6,784	54,060	.338	2.692		
Copper rolling and drawing (83)	2.4348	155.831	1,565	49	3,811	119	.244	.008		
Primary lead (84)	2.4340	120.806	30	6,720	73	16,357	.004	.812		
Primary zinc (85)	2.4350	166.224	1,379	2,672	3,358	6,506	.229	.444		
Primary metals, n.e.c. (86)	2.4348	131.553	396	18,913	964	46,049	.052	2.488		
Nonferrous metal rolling, n.e.c. (87)	2.4349	148.977	983	16	2,394	39	.146	.002		
Primary aluminum (88)	3.2849	144.156	204	761	670	2,500	.029	.110		
Aluminum rolling qnd drawing (89)	2.1816	177.628	1,769	0	3,859	0	.314	0		
Secondary nonferrous metals (90)	2.4355	125.398	282	6,396	687	15,578	.035	.802		
Nonferrous foundries (91)	2.1821	244.406	120	16	262	35	.029	.004		

TABLE 2—*Continued*

Industry[b]	Direct and indirect requirements per million dollars of final output		Exports per million dollars of total exports[e]	Imports per million dollars of total imports[f]	Requirements per million dollars of exports and import replacements of average (1947) composition				Comparison of export and imports requirements[g]	
	Capital[c]	Labor[d]			Capital		Labor			
					Exports	Import replace.	Exports	Import replace.	Cap.	Lab.
1	2	3	4	5	6	7	8	9	10	11
	(Millions of dollars)	(Man years)	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Man years)	(Man years)		
17. Plumbing and heating supplies			3,202	49	*2,048,157*	*2,046,700*	*211.118*	*204.647*	≥	>
Metal plumbing and vitreous fixtures (97)	2.0510	223.913	1,085	0	2,225	0	.243	0		
Heating equipment (98)	2.0467	204.647	2,117	49	4,333	100	.433	.010		
18. Fabricated structural metal products			4,053	179	*1,748,187*	*1,796,648*	*182.087*	*178.771*	<	≥
Structural metal products (99)	1.6954	183.767	2,518	49	4,269	83	.463	.009		
Boiler shop products (100a)	1.8348	178.945	1,535	130	2,816	239	.275	.023		
19. Other fabricated metal products			16,531	1,262	*2,011,342*	*1,971,712*	*203.738*	*207.607*	≥	≤
Tin cans and other tinware (93)	2.1458	174.998	791	32	1,697	69	.138	.006		
Cutlery (94)	2.0414	241.579	1,229	178	2,509	363	.297	.043		
Tools and general hardware (95)	2.0421	227.946	3,130	259	6,392	529	.713	.059		
Hardware, n.e.c. (96)	2.0459	228.406	1,811	16	3,705	33	.414	.004		
Metal stampings (101)	1.8530	202.075	2,075	453	3,845	839	.419	.092		
Metal coating and engraving (102)	2.0457	264.165	0	0	0	0	0	0		
Lighting fixtures (103)	2.0419	195.244	2,140	16	4,370	33	.418	.003		
Fabricated wire products (104)	2.0401	169.167	3,286	49	6,704	100	.556	.008		
Metal barrels, drums, etc. (105)	2.0397	164.918	486	130	991	265	.080	.021		
Tubes and foils (106)	2.0399	206.580	282	32	575	65	.058	.007		
Miscellaneous fabricated metal products (107)	2.0406	190.366	258	65	527	133	.049	.012		
Steel springs (108)	2.0397	172.761	0	0	0	0	0	0		
Nuts, bolts and screw machine products (109)	1.8550	216.333	1,043	32	1,935	59	.226	.007		
20. Agriculture, mining and construction machinery			34,518	5,667	*2,083,252*	*2,115,952*	*193.059*	*202.400*	≤	<
Tractors (112a)	2.1098	185.783	11,722	1,457	24,731	3,074	2.178	.271		
Farm equipment (113)	2.1183	208.218	5,504	4,194	11,659	8,884	1.146	.873		
Construction and mining machinery (114)	2.0541	188.271	12,081	16	24,816	33	2.275	.003		
Oil field machinery and tools (115)	2.0541	204.419	5,211	0	10,704	0	1.065	0		
21. Metal working machinery (116–117)	2.1793	212.211	12,633	227	27,531	495	2.681	.048		
22. Other non-electric machinery			58,836	3,238	*1,901,679*	*1,978,413*	*195.442*	*192.712*	<	≥
Fabricated pipe (100b)	1.6724	176.071	0	0	0	0	0	0		
Steam engines and turbines (110)	1.6334	234.085	1,409	16	2,302	26	.330	.004		
Internal combustion engines (111)	1.6334	183.850	6,212	389	10,147	635	1.142	.072		
Industrial trucks (112b)	1.8509	175.047	851	0	1,575	0	.149	0		
Special industrial machinery (118)	2.1146	202.576	19,684	1,943	41,624	4,109	3.988	.394		
Pumps and compressors (119)	1.8797	179.349	4,335	0	8,149	0	.777	0		
Elevators and conveyors (120)	1.8754	181.040	2,452	0	4,599	0	.444	0		
Blowers and fans (121)	1.8744	182.857	396	0	742	0	.072	0		
Power transmission equipment (122)	1.8749	204.820	162	0	304	0	.033	0		
Industrial machinery, n.e.c. (123)	1.8748	170.428	2,494	648	4,676	1,215	.425	.110		
Commercial machines and equipment, n.e.c. (124)	1.8185	224.616	7,051	32	12,822	58	1.584	.007		
Refrigeration equipment (125)	1.6074	169.170	6,697	0	10,765	0	1.133	0		
Valves and fittings (126)	2.2257	211.626	2,782	0	6,192	0	.589	0		
Ball and roller bearings (127)	2.2110	233.258	1,457	32	3,221	71	.340	.007		
Machine shops (128)	2.2131	212.277	156	0	345	0	.033	0		
Electrical appliances (135a)	1.6404	170.386	2,698	178	4,426	292	.460	.030		
23. Motors and generators (131)	1.3747	202.568	4,383	97	6,025	133	.888	.020		
24. Radios and related products (139)	1.5768	249.783	6,763	130	10,664	205	1.689	.032		
25. Other electrical machinery			15,794	193	*1,767,716*	*1,771,503*	*218.121*	*202.073*	≤	>
Wiring devices and graphite products (129)	1.7708	200.531	1,745	16	3,090	28	.350	.003		
Measuring instruments (130)	1.7748	224.339	714	16	1,267	28	.160	.004		
Transformers (132)	1.7713	204.589	971	0	1,720	0	.199	0		
Control apparatus (133)	1.7731	214.419	1,679	0	2,977	0	.360	0		
Welding apparatus (134)	1.7717	183.887	1,289	49	2,284	87	.237	.009		
Heating appliances (135b)	1.7181	179.511	1,163	0	1,998	0	.209	0		
Insulated wire and cable (136)	1.7663	172.350	1,457	16	2,574	28	.251	.003		
Engine electrical equipment (137)	1.7690	297.422	971	0	1,718	0	.289	0		
Electric lamps (138)	1.7678	226.812	726	32	1,283	57	.165	.007		
Tubes (140)	1.7763	297.568	947	0	1,682	0	.282	0		
Communication equipment (141)	1.7744	231.621	2,147	32	3,810	57	.497	.007		
Storage batteries (142)	1.7695	154.318	576	16	1,019	28	.089	.002		
Primary batteries (143)	1.7697	209.119	486	0	860	0	.102	0		
X-ray apparatus (144)	1.7742	276.505	923	16	1,638	28	.255	.004		
26. Motor vehicles			61,151	1,085	*2,104,799*	*2,104,799*	*201.779*	*201.476*	=	≥
Motor vehicles (145)	2.1048	201.476	59,892	1,085	126,061	2,284	12.067	.219		
Truck trailers (146)	2.1048	216.227	1,259	0	2,650	0	.272	0		
Automobile trailers (147)	2.1048	210.641	0	0	0	0	0	0		

TABLE 2—*Continued*

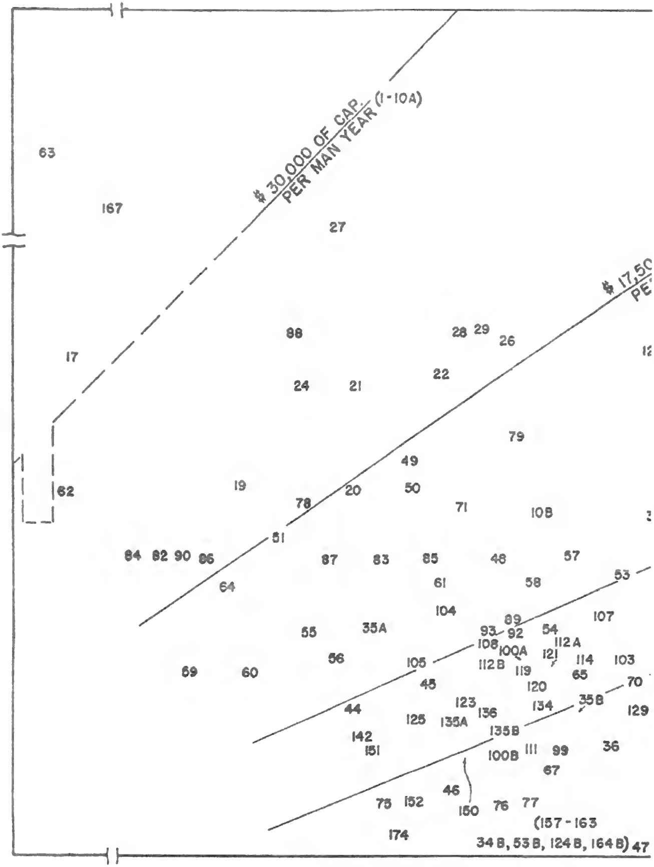
Industry[b]	Direct and indirect requirements per million dollars of final output		Exports per million dollars of total exports[e]	Imports per million dollars of total imports[f]	Requirements per million dollars of exports and import replacements of average (1947) composition				Comparison of export and imports requirements[g]	
	Capital[c]	Labor[d]			Capital		Labor			
					Exports	Import replace.	Exports	Import. replace.	Cap.	Lab.
1	2	3	4	5	6	7	8	9	10	11
	(Millions of dollars)	(Man years)	(Dollars)	(Dollars)	(Dollars)	(Dollars)	(Man years)	(Man years)		
27a. Other transportation equipment			20,236	1,247	*1,678,459*	*1,528,148*	*189.761*	*169.206*	>	>
Aircraft and parts (148)	1.7328	235.024	7,525	130	13,039	225	1.769	.031		
Locomotives (150)	1.6663	170.126	4,731	16	7,883	27	.805	.003		
Railroad equipment (151)	1.6663	158.126	6,433	0	10,719	0	1.017	0		
Motorcycles and bicycles (152)	1.5019	161.216	1,547	1,101	2,323	1,654	.249	.177		
27b. Ships and boats (149)	2.1404	263.615	5,360	810	11,473	1,734	1.413	.214		
28a. Professional and scientific equipment			6,566	11,529	*1,844,913*	*1,840,559*	*251.904*	*238.442*	≥	>
Scientific instruments (153)	1.8465	266.625	3,748	65	6,921	120	.999	.017		
Medical and dental instruments and supplies (155)	1.8437	229.939	2,039	97	3,759	179	.469	.022		
Watches and clocks (156)	1.8405	238.387	779	11,367	1,434	20,921	.186	2.710		
28b. Optical, ophthalmic and photo equipment (154)	1.8465	311.213	4,707	680	8,692	1,256	1.465	.212		
29. Miscellaneous manufacturing (157–163)	1.4382	186.429	10,762	23,771	15,478	34,188	2.006	4.432		
30. Coal, gas and electric power			22,083	1,133	*1,790,214*	*3,702,030*	*209.573*	*136.805*	<	>
Coal mining (16)	1.7821	209.883	22,011	259	39,226	462	4.620	.054		
Electric light and power (167)	4.2709	115.066	72	874	308	3,733	.008	.101		
Natural, manufactured and mixed gas (168)	2.2676	97.194	0	0	0	0	0	0		
31. Railroad transportation (169)	3.9285	186.879	40,957	0	160,900	0	7.654	0		
32. Ocean transportation (172)	2.6324	165.090	80,361	40,157	211,542	105,709	13.267	6.630		
33. Other transportation			20,068	2,364	*2,007,843*	*2,151,946*	*165.238*	*150.592*	<	>
Trucking (170)	1.1152	152.922	9,018	0	10,057	0	1.379	0		
Warehousing and storage (171)	3.9155	376.255	1,529	0	5,987	0	.575	0		
Other water transportation (173)	4.2776	119.141	3,933	696	16,824	2,977	.469	.083		
Air transportation (174)	1.2650	163.866	4,976	1,668	6,295	2,110	.815	.273		
Pipeline transportation (175)	1.8485	127.555	612	0	1,131	0	.078	0		
Local and highway transportation (178)	1.0436	173.106	0	0	0	0	0	0		
34. Trade			62,302	0	*1,417,208*		*185.452*			
Wholesale trade (176)	1.4157	185.346	62,158	0	87,997	0	11.521	0		
Retail trade (177)	2.0683	228.730	144	0	298	0	.033	0		
35. Communications			2,272	0	*5,097,887*		*246.360*			
Telephone and telegraph (179)	5.0979	246.360	2,272	0	11,582	0	.560	0		
Radio broadcasting (186a)	.8310	57.460	0	0	0	0	0	0		
36. Banking, finance and insurance (181)	.4699	134.774	8,106	16,516	3,809	7,761	1.092	2.226		
37. Business services[i] (186b–187)	1.6345	240.990	156	0	255	0	.038	0		
38. Amusements[i] (190)	2.2801	237.204	7,687	0	17,527	0	1.823	0		

the similarity of their structural relationship to the rest of the economy constituted the guiding principle in the aggregation of the individual industries into the larger sectors. What is even more important, whatever errors do occur in these basic computations, can have no biasing effect on the final results of our numerical analysis. The disregard of differences between the *indirect* capital and labor requirements of industries belonging to the same group has, furthermore, a theoretical reason which will become clear in the course of the later argument.

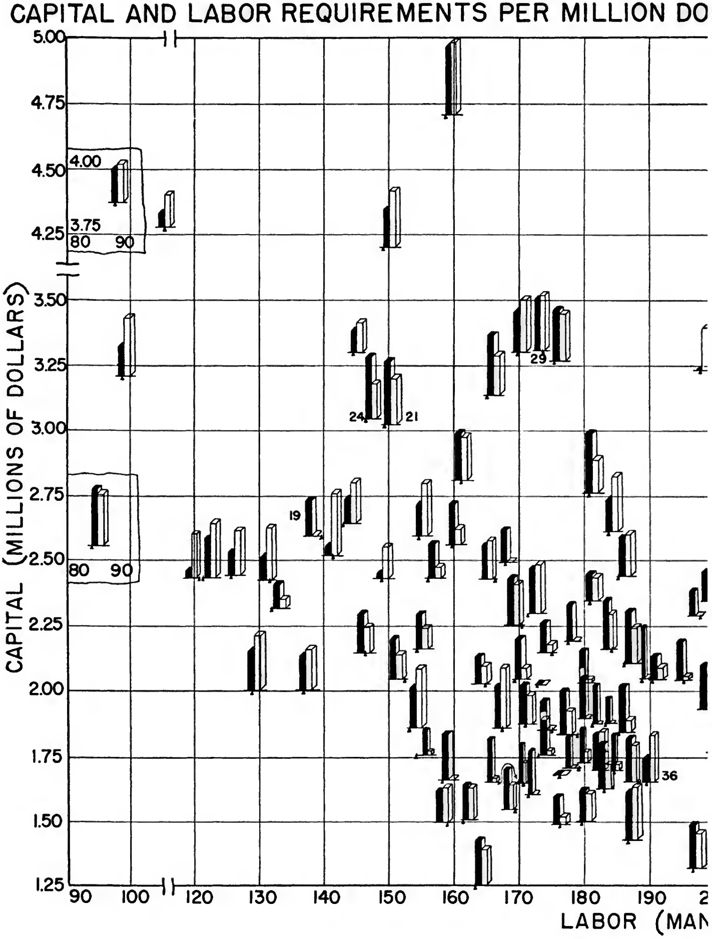
IV. COMPUTATION OF EXPORT AND OF IMPORT REPLACEMENT COSTS

Now we are ready to find out whether it is true that the United States exports commodities the domestic production of which absorb relatively large amounts of capital and little labor and imports foreign goods and services which—if we had produced them at home—would employ a great quantity of indigenous labor but a small amount of domestic capital.

Let us imagine a situation in which the United States, for some reason wanted to reduce its de-



Overlay Chart for figure 1, Wassily Leontief, Domestic product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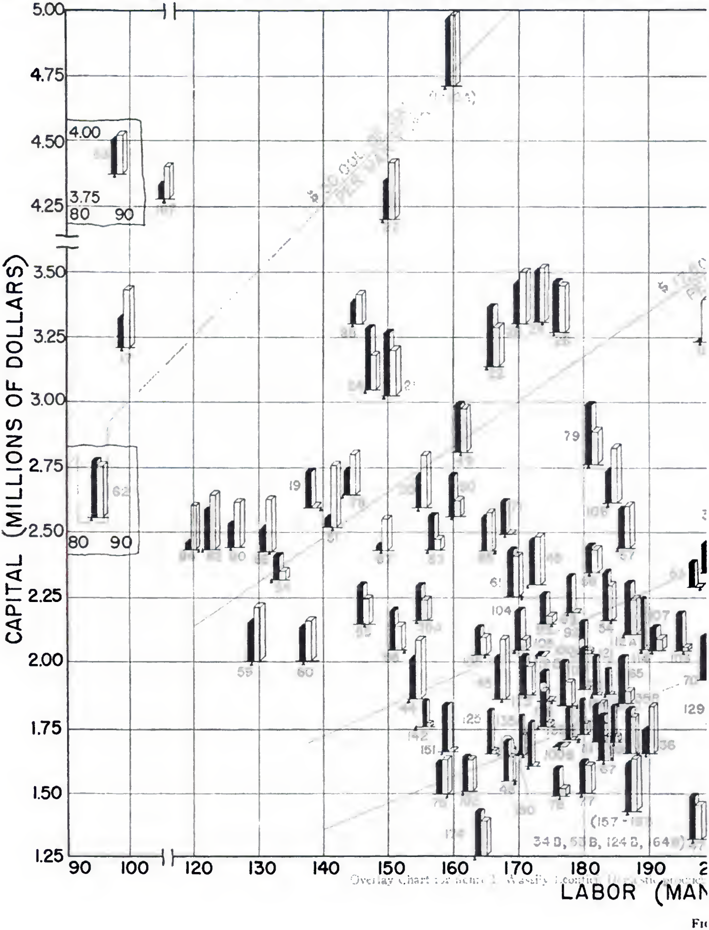

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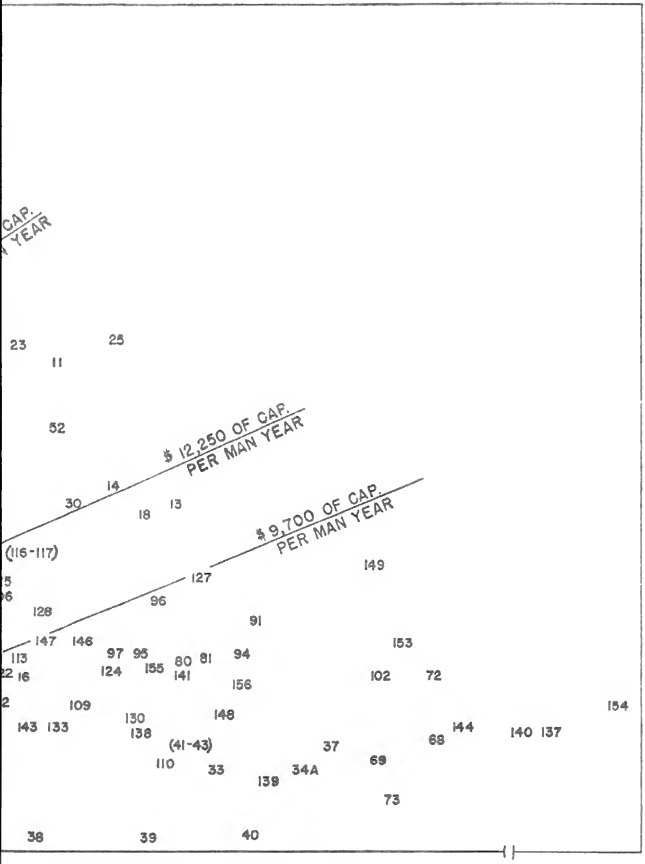
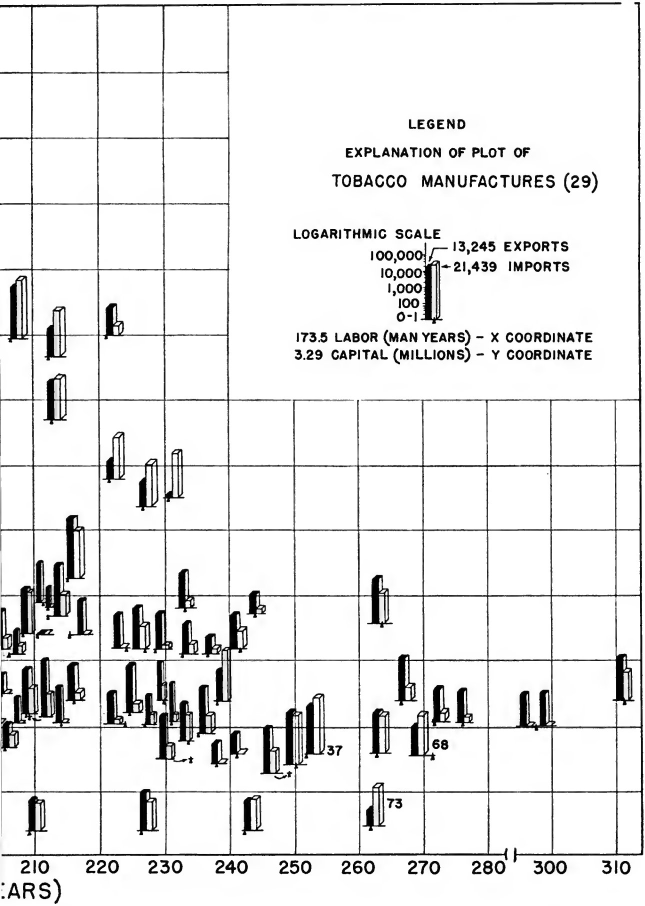
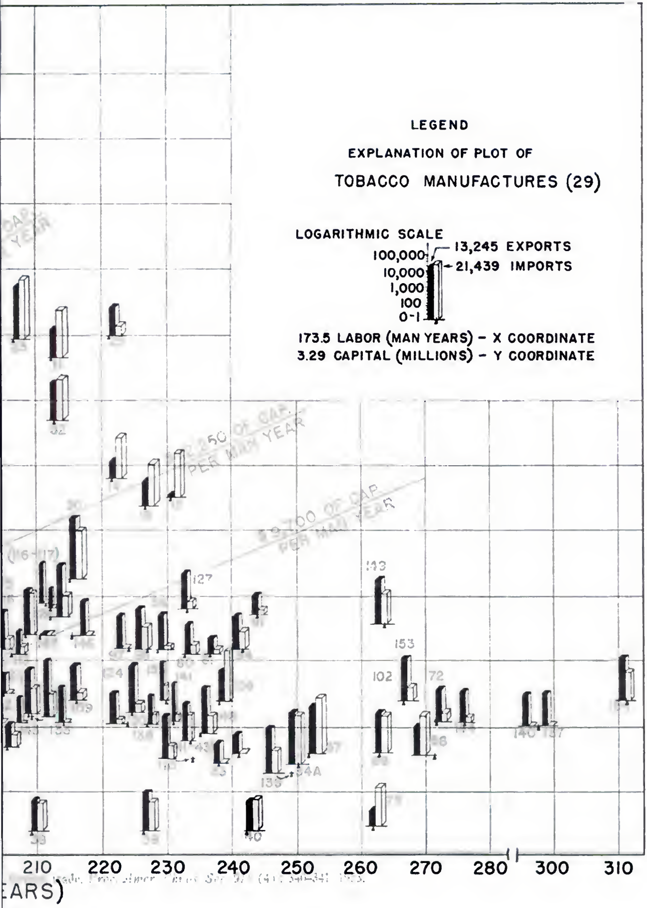


foreign trade, *Proc. Amer. Philos. Soc.* 97: (4) : 340–341, 1953.

ARS OF U.S. EXPORTS AND IMPORT REPLACEMENTS



ARS OF U.S. EXPORTS AND IMPORT REPLACEMENTS



pendence on foreign countries and, to achieve this end, decided to decrease both its imports and exports by one million dollars each. Let us, in particular, examine the rather plausible case in which the reduction of exports is to be achieved by an equal proportional cut in each export commodity so that after the reduction the percentage composition of exports remains unchanged. The same procedure can be applied to so-called competitive imports, i.e., imports of commodities which can be and are, at least in part, actually produced by domestic industries. The level of non-competitive imports which, conventionally, are taken to comprise coffee, tea, jute (but not rubber, which can now be commercially synthesized) and a few other, minor items, is assumed to remain at the same time unchanged. Such an exemption obviously has a good common sense basis. Moreover, within the context of the present analysis, it also has the closely related reason that labor and capital requirements for the domestic production of, say, coffee, cannot be realistically assessed. For later reference, one might observe that hot houses and heating installations would in any case require inordinately large capital investment per million dollars' worth of competitively produced Florida or California coffee.

To replace a million dollars' worth of imports we would have to raise the output of the corresponding United States industries. If competitive imports were, as has been assumed, cut proportionally all along the line, the domestic production of the specific goods involved would have to expand by the amounts equal to the reduction in the corresponding imports, i.e. by the same proportional amounts. If, for example, newsprint constituted twenty per cent of all competitive imports, and woolens ten, then in replacing the total of one million dollars' worth of competitive imports, the domestic output of newsprint would have to be increased by two hundred thousand dollars and the production of woolens by one hundred thousand dollars.

Such domestic production for replacing imports would mean additional direct and indirect capital and labor requirements. These can be determined in the following way.

The large 200 industries input-output table of the American economy for the year 1947 shows the competitive imports for that year classified by the commodity groups into which they would fall if they had been produced by our domestic industries. Dividing each one of these figures by the aggregate dollar value of all competitive imports gives us the amounts by which the domestic outputs of these goods and services would have to be increased if our economy proceeded to replace commodity by commodity an aggregate million dollars' worth of (proportionally reduced) competitive imports. Column 5 in table 2 shows the composition of an average million dollars' worth of competitive imports. To compute the total amount of capital which would be required to produce domestically this particular collection of commodities, one has only to multiply each of these figures by the corresponding capital requirements listed in column 2 and then find the sum total of the resulting products. The products—one for each kind of the competitive imports—are entered in column 7.

An analogous computation yields the corresponding labor requirements. Column 9 shows the number of American man years which, in combination with the capital entered in column 7, would have to be employed to replace the foreign goods and services listed in column 3 with similar goods produced domestically.[5]

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[5] For the purposes of the present analysis, we were able to utilize the previously completed computation which shows the effects of any given change in "final demand" on the levels of output of all American industries. (See Evans and Hoffenberg, *ibid.*) The results of these original computations must, however, be subjected to a quantitatively not very significant but in principle very important adjustment.

Common sense reasoning as well as actual experience shows that whenever any one of the American industries expands or contracts, the level of its operation tends to increase (or to decrease) its demand for imported inputs in a way analogous to the increases (or decreases) in its requirements for materials and services of domestic origin. An increase in the rate of our domestic outputs will, therefore, in general, lead to a rise in the volume of the dependent imports. The usual input-output computations thus present the United States' imports as depending on the level of final demand which, in particular, implies that any rise in exports would necessarily require an increase in imports.

For the purposes of the present analysis, this conclusion should certainly be retained in respect to inputs which are unlikely to be replaced by a supply coming from domestic sources. Coffee, jute, tin, and a number of other raw materials can be safely included in this "non-competitive" category. In evaluating the effect of increased exports on domestic capital requirements, it seems to be reasonable to assume that whatever additional indirect demand for the above type of goods will arise, it will be satisfied by foreign sources. In other words, in contemplating any possible changes in the level and the composition of our exports and imports—as they would result from alternative patterns of American foreign economic policy—it is reasonable to assume that the volume of such *non-*

The quantities of capital and of labor absorbed by the American economy per million dollars of its 1947 exports can be determined exactly in the same way. Column 4 in table 2 shows the composition of an average million dollars' worth of the United States' exports. The quantities of capital and labor required to produce the indicated amount of each export—obtained by multiplying each figure in column 4 by the corresponding figure in columns 2 and 3—are entered in columns 6 and 8, respectively.

V. EMPIRICAL FINDINGS AND THEIR INTERPRETATION

The principal findings of the quantitative factual analysis described above are summarized in the following figures:

Domestic Capital and Labor Requirements per Million Dollars of U. S. Exports and of Competitive Import Replacements (of Average 1947 Composition)

	Exports	Import Replacements
Capital (dollars, in 1947 prices)	2,550,780	3,091,339
Labor (man years)	182.313	170.004

These figures show that an average million dollars' worth of our exports embodies considerably less capital and somewhat more labor[6] than would be required to replace from domestic production an equivalent amount of our competitive imports. America's participation in the international division of labor is based on its specialization on labor intensive, rather than capital intensive, lines of production. In other words, this country resorts to foreign trade in order to economize its capital and dispose of its surplus labor, rather than *vice versa*. The widely held opinion that—as compared with the rest of the world—the United States' economy is characterized by a relative surplus of capital and a relative shortage of labor proves to be wrong. As a matter of fact, the opposite is true.

What is the explanation of this somewhat unexpected result? The conventional view of the position which the United States occupies today in the world economy is based—as has been previously explained—first, on an empirical observation and second, on a factual assumption. The observation is that the United States possesses more productive capital per worker than any other country. It can hardly be disputed.

To reach the conclusion that this means that there exists a comparative surplus of capital and

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competitive imports will be in the future as in the past directly determined by structurally conditioned domestic requirements.

With the typical competitive imports—such as cars, most other highly manufactured products, and also some raw materials such as, for example, crude oil—the situation is entirely different. If the problem of comparative costs, i.e., the question of possible alternative patterns of trade is to have any meaning in respect to such commodities, one must explicitly consider stepped-up domestic production as being an alternative to imports and *vice versa*. In this context, an increase in final demand and particularly an increase in export demand should not be assumed to result in an automatic rise in competitive imports. On the contrary, the domestic repercussion—for example, the change in domestic capital and labor requirements—of additional exports must first of all be computed on the assumption that whatever virtual demand for competitive importation might arise, it will be satisfied entirely and only through expansion of domestic output. The possibility of increasing the imports of such competitive commodities has to be considered as a separate alternative. The capital saving effects of such imports are explicitly taken into account when one separately postulates the expected changes in the level of specific competitive imports and computes the repercussion of such imports on domestic capital requirements.

In a very open economy, such, for example, as the British, the difference between the domestic reactions computed first on the assumption of an automatically induced change in the level of competing imports and then without such induced changes might be quite large; in the case of the United States—the most self-sufficient of the modern western economies—such discrepancy will be quite small. It was still, however, taken into account in the present study.

[6] There exists a good reason to believe that the excess of the labor requirements per million dollars' worth of American exports over the labor requirements for the equivalent amount of imports replacing output is actually larger than our computations shows it to be.

Part of the labor input entering in both of these figures consists of agricultural labor. Agricultural employment figures are well-known to be biased in the upward direction partly because many persons living on the farms do not actually work on them and partly because a very large portion of agricultural labor input is absorbed, one could nearly say wasted, in marginal subsistence farming.

Since the agricultural employment contributes less to the labor requirement of our exports than it does to the replacement requirements for our competitive imports, any downward revision in that figure would tend to increase the difference between these two figures.

The labor requirements shown in the summary table presented above are split between the agricultural and all other labor as follows:

Agricultural and Non-Agricultural Labor Requirements per Million Dollars of U. S. Exports and of Competitive Import-Replacement (of Average 1947 Composition)

	Exports	Import Replacements
Agricultural labor (man years)	22.436	40.934
Non-Agricultural (man years)	159.872	129.069
Total	182.308	170.003

a scarcity of labor in this country, the conventional argument must combine the foregoing observation with the implicit assumption that the *relative* productivity of capital and labor—if compared industry by industry—is the same here and abroad. Concretely, this assertion means that if in the United States we can transform ten pounds of yarn into a corresponding amount of finished cloth by using, say, one man year and two thousand dollars' worth of machinery, and transform a barrel of oil into gasoline by using one man year and twenty thousand dollars' worth of equipment, the corresponding foreign industries can perform each of these two operations either with exactly identical inputs of capital and labor or—if this is not the case—at least with inputs differing in both (and all the other) industries in the same proportion. So, for example, if in India one could weave ten pounds of yarn by using two man years and four thousand dollars' worth of machinery (instead of one man year and two thousand dollars as in the United States) the cracking of one barrel of oil could also be accomplished by using a double quantity of both factors, i.e., two man years and forty thousand dollars' worth of equipment.

Only on the basis of such an assumption, will the comparative costs argument necessarily lead to the conclusion that a country possessing a large stock of capital and a relatively small number of workers will find it advantageous to specialize in industries which, in terms of its own productive possibilities, require much capital and relatively little labor.

Let us, however, reject the simple but tenuous postulate of comparative technological parity and make the plausible alternative assumption that in any combination with a given quantity of capital, one man year of American labor is equivalent to, say, three man years of foreign labor. Then, in comparing the relative amounts of capital and labor possessed by the United States and the rest of the world—a comparison used for the explanation of their respective specialization in capital or labor intensive industries respectively—the total number of American workers must be multiplied by three, which would increase our 1947 labor force from 65 million to three times that number, i.e., 195 million of "equivalent" foreign man years. Spread trice as thinly as the unadjusted figures suggest the American capital supply per "equivalent worker" turns out to be comparatively smaller, rather than larger, than that of many other countries.

This, I submit, is the analytical explanation of the results of our empirical findings. In terms of the relative production possibilities here and abroad, the United States is rich in man power and poor in capital. This country resorts to foreign trade to save its capital and to dispose of its relative surplus labor.

Our data obviously cannot explain why American labor is more productive than foreign labor. The problem of productivity is so intricate and has been so thoroughly discussed elsewhere that no casual remarks can possibly advance its solution. The following negative observation, however, has a direct bearing on the subject of the present analysis and on the possible interpretation of its principal findings.

The extent to which the high relative efficiency of American man power causes this country to exchange goods which absorb relatively little capital for those which would require more capital if we chose to produce them at home, *cannot* be due simply to the large amount of capital which American industry uses per employed worker.

The fact that workers are frequently replaced by machines cannot be denied. But such technological substitution, if profitable in United States, would in general be profitable also in the corresponding industries abroad. The argument that the comparative shortage of capital might prevent the use of the same labor-saving technology by foreign countries would only hold if international trade, i.e., the international division of labor, did not exist. Actually, it does take place and if it were simply the problem of substituting capital for labor, foreign countries could and would imitate the American production practice industry by industry. At the same time, their production would be concentrated on those commodities which, both there as well as in the United States, require relatively little capital and large amounts of labor. The United States would for similar reasons concentrate on capital intensive industries and the trade between it and the rest of the world would consist in an exchange of American capital intensive against foreign labor intensive goods.[7] Our empirical findings indicate that in fact the opposite is true.

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[7] To clarify the internal logic of the argument leading to this assertion, let us consider—from the point of view of the world as a whole—the double problem of, first, allocating capital and labor between the various industries and, second, of locating the various industries in specific countries endowed with different relative amounts of capital and labor.

Thus, without denying that capital can be substituted for labor, we must still look for some other reason in explaining the high productivity of labor in America as compared with the labor employed by similar industries abroad.

Entrepreneurship and superior organization have often been mentioned in this connection. In accepting this most plausible explanation, we must, however, make the following comment. Both these, as well as such other factors as education or the general climate of our production oriented society do certainly make the American economy more efficient in the sense that it is able to achieve the same output of finished commodities and services with smaller inputs of capital and labor. There exists a definite statistical evidence that the man hour and the capital investment both measured per unit of output have been reduced in many of our industries through better utilization of equipment and more rational use of labor.[8] To explain the comparative surplus of labor which our figures unmistakably reveal, we must, however, also infer that entrepreneurship, superior organization and favorable environment must have increased—in comparison with other countries—the productivity of American labor much more than they have raised the efficiency of American capital.

From the point of view of sheer arithmetic, the American comparative capital shortage and labor surplus—as revealed in our figures—could, of course, be equally well explained if instead of assuming that American man years are more productive than foreign man years we took the labor productivity to be the same here and abroad, but at the same time assumed the United States' capital to be less productive than its dollar equivalent in foreign countries. Such an alternative explanation, implying an absolute inferiority of the American productive technology, hardly would pass the test of empirical scrutiny; it is plainly contradicted by the fact an average American man year receives a much higher remuneration than the man year of labor employed in most other countries.

VI. EMPIRICAL ANALYSIS OF SUBSIDIARY RELATIONSHIPS

Before directing your attention to the wider economic implications of these general conclusions, it is well to examine once more their empirical background.

Although computed on the basis of a rather detailed industrial classification, the amounts of capital and labor used in the production of Ameri-

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If in accordance with the conventional argument, but in contradiction to the argument presented in this paper, one considers the technological possibilities to be the same throughout the world, i.e., if one assumes that with a given amount of capital and a given number of indigenous man years, every industry in England, in India or anywhere else is able to produce an output equal to that which the corresponding American industry *could* achieve with the *same* amount of capital and an equal number of (American) man years, that double task can be accomplished in the following two steps.

First, considering the total stock of capital and the combined supply of labor of all countries and taking in account the total world demand for various commodities and services, the proverbial "invisible band" of competitive adjustment would determine—on the basis of the uniform technological possibilities of the world as a whole—the proper amounts of capital and labor which each industry would best use per, say, every million dollars' worth of its respective output. Barring certain special, unusual situations, this decision could and would be made without any regard to the actual distribution of the combined labor and capital resources of the world between the different countries. This distribution could be taken into account separately in the next step in which all the individual industries would be actually assigned to the separate countries. In accordance with the "comparative supply of factors" considerations described in the first section of this paper, this second step will result in placing the industries requiring relatively large amount of capital into the countries comparatively well supplied with that particular factor and in locating the labor intensive lines of production in the areas having a comparatively larger supply of labor.

As a final result of such efficient "comparative costs" allocation, the capital rich countries must specialize on the production and export of capital intensive goods, while the labor rich areas will produce and export labor intensive commodities, while importing goods which, when produced at home, would absorb comparatively large amounts of capital and little labor.

It is particularly important to observe that under the assumption of technological parity the combination of capital and labor used in each industry—having been decided in the first stage of the two stage allocation procedure described above—will necessarily be the same in all the countries. For example, any specific textile product requiring much capital and little labor when made in the United States would require the same combination of these two factors also, if it had been produced in England, in India or in any other country. Being short of capital, i.e., of the factor which this product uses most, these other countries would, however, manufacture only relatively small amounts of that particular textile or even none at all.

[8] See Leontief, Wassily, Machines and man, *Sci. Amer.* **187**: 150–160, 1952. A different point of view is presented in the detailed factual study by Rostas, L., *Comparative productivity in British and American industry,* Cambridge Univ. Press, 1948.

can exports and those required for the replacement of competitive imports have been compared above only in terms of the over-all averages. If the explanation which has been given to these quantitative findings is correct, similar relationships should also be discovered within separate commodity groups.

A visual presentation of the quantitative relationships revealed by the figures contained in the first four columns of table 2 is given in figure 1. Since we deal here with essentially four-dimensional phenomena, they cannot possibly be described in an ordinary two-dimensional graph. Each one of the black-white blocks on the graph, figure 1, must be visualized as standing on the flat surface of the paper not unlike a diminutive skyscraper rising above the base map in a three-dimensional model of New York City. Each block represents a separate commodity type. Its position, or more exactly the position of its base, on the flat surface of the map reflects the capital-labor combination per million dollars of output required for its production in the United States; the capital requirement being measured upward along the scale marked along the left hand side of the chart, and the labor requirements—horizontally, along the man years scale entered along the bottom margin.

The length of the black strip in each block (in a truly three-dimensional figure it would be measured by its height above the capital-labor plane) represents the level of exports and the white strip, the imports of commodities of particular kind (see, for example, the explanation of the plot of Tobacco Manufactures (29) as given in the legend on the figure).

To facilitate the identification of all the individual blocks on the graph, their numbers—entered in brackets after the name of each industry in column 1 of table 2—are printed on a separate transparent sheet which can be superimposed on the graph. To make it possible to distinguish at a glance the proportions in which capital and labor are combined in the U. S. production of the various commodities, red reference lines are entered on the same overlay sheet showing the capital/labor ratios of $30,000 per man year, $17,500 per man year, and so on. The capital/labor ratios, i.e., the slopes of these four lines are chosen so as to include as nearly as possible one fifth of the total U. S. foreign trade turnover (i.e., of exports per million dollars of total exports plus imports per million dollars of total imports, as listed in column 4 and column 5 of table 2) into each of the resulting five radial segments in figure 1.

One can clearly see that in the upper left hand part of the map, i.e., in the sectors containing goods which require for their production larger amounts of capital and comparatively small quantities of labor, the white parts tend to be taller than the black parts of the same blocks. As one moves towards the lower right hand corner, the black strips tend to become higher than the corresponding white strips; the tendency to export goods requiring much labor and little capital for their domestic production and to import those which demand much capital and little labor can in other words be as clearly discerned in this detailed picture as it is reflected in the over-all averages presented above.[9]

The results of this visual examination are substantiated by the following numerical compilation.

EXPORTS AND IMPORTS COMPARED BY SECTORS WITH DIFFERENT CAPITAL INTENSITY

Capital Per Man Year (In Dollars)	Trade Turnover* (In Dollars)	Percentage of Turnover	
		Exports	Imports
1	2	3	4
More than 30,000	411,103	27.39	72.61
30,000–17,750	394,465	47.90	52.10
17,750–12,250	372,425	48.31	51.69
12,250– 9,700	395,028	61.76	38.24
Less than 9,700	393,869	69.62	30.38
Aggregate	1,965,890	50.82	49.18

* Turnover within the line segments is not exactly equal since they had to be summed for integral industries. Aggregate turnover differs from two million dollars due to rounding and the omission of the Other Nonferrous Mineral Mining industry—*cf.* footnote f, table 2.

It shows that as the capital/labor ratio goes down, exports make up an ever larger and imports a smaller fraction of the corresponding foreign trade turnovers.

We have examined the over-all choice which the American economy makes when it allocates its capital and labor to produce a million dollars' worth of the average combination of exportable goods instead of using them to replace an equivalent average combination of imports. Behind it are subsidiary choices based on differences in the labor and capital requirements of specific export and import goods belonging to the same commodity group and because of that directly competing with each other. The presence of direct competitive relationships—or at least of more direct competitive relationships than those which exist among all commodities entering international trade—is of the essence for the existence of such separate subsidiary allocation problems. A proper isolation and detailed quantitative description of such "internally competitive" groups constitutes the necessary prerequisite for their empirical analysis.

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[9] The following ten service industries are omitted from presentation in our figure: Railroad Transportation (31), Trucking (170), Warehousing and Storage (171), Pipeline Transport (175), Local and Highway Transportation (178), Wholesale Trade (176), Retail Trade (177), Banking, etc. (36), Amusements (38), Communications (35), and Other Water Transportation (173). Being essentially non-transportable, the products of these industries cannot enter in any direct competition with imputed products of the same kind.

The study of this particular aspect of our primary data has not yet been completed.[10] A careful perusal of the composition of American exports and imports as listed in columns 4 and 5 of table 2 enables us, nevertheless, to delineate a number of commodity groups which might reasonably, i.e., on the basis of the general knowledge one has about them, qualify for preliminary analysis. As should be expected, they correspond rather closely to the thirty-eight consolidated industries described above. Some of the latter, however, had to be broken down so as to separate important sets of obviously non-competing operations, such as, for example, the mining and final fabrication of metals; from some others, single non-competitive components had to be eliminated. A large number of export and import goods (although all of these, of course, were included in the computation of the over-all average capital and labor requirements) had to be omitted from the following analysis because they either did not fall into any definite competitive set, or formed small sets containing only two or three items.

Most commodities were actually combined in "internally competing" groups and each set was subjected separately to the same analysis which was previously applied to all exports and all competitive imports taken together. The average amount of capital and the average quantity of labor required to produce a million dollars' worth of exports falling within each such commodity group were computed; similar computations were performed for the corresponding sets of competitive—in this case directly competitive—imports. In each instance the average was obtained by weighting the capital and labor requirements of an individual product (as listed in columns 2 and 3 of table 2) in proportion to the value of the exports and imports of that particular product per million dollars of the exports and imports respectively for the group into which it belongs as a whole. The results of these computations are entered (in italics) in columns 6, 7, 8, and 9 opposite the names of the groups listed on the left in column 1.

To facilitate the interpretation of these subsidiary computations, the results of the comparison of the capital and labor requirements for export and import replacement within each of the twenty-six distinct "internally competitive" groups are shown in the last two columns (columns 10 and 11) of table 2. The sign ">" indicates that the export requirement exceeds the corresponding requirement for import replacement, "<" shows that the import replacement requirement is the larger of the two. To mark very small differences (amounting to less than 2 per cent of the larger of the two figures) which should perhaps be interpreted as equalities, we used the signs "≥" and "≤".

The following box scores summarize the final results showing the values of exports and competitive imports which fall within each of the distinct

Exports (Unit: one thousand dollars)

Capital

Labor	<	≤ ≥	>	Total
<	106	45	0	150
≤ ≥	97	78	0	176
>	145 (+309)	97	58	300 (+309)
Total	348 (+309)	220	58	

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[10] This study leads directly toward the problems involved in generalized formulation of interregional input-output theory. The distinction between typically "domestic" and the predominately "international" commodities is as fundamental for such analysis as the lower order distinction between "national" and "regional" commodities used in the study of the regional structure of the United States' economy. (See, Leontief, Wassily, *et al., Studies in the structure of the American economy,* Chap. 4 and 5.)

Competitive imports (Unit: one thousand dollars)

Capital

Labor	<	≤ ≥	>	Total
<	98	6	0	104
≤ ≥	25	50	0	75
>	308 (+408)	99	6	413 (+408)
Total	431 (+408)	155	6	

"comparative cost types" per million dollars of all exports and competitive imports, respectively. Only 63 per cent of all exports and 59 per cent of imports fell into specific competitive groups. The rest which did not fit into any one of them constitutes, so to say, a separate group. On the basis of its comparative labor and capital requirements for exports and import replacements, this residual group falls in the lower left box. It is represented by the bracketed figures.

The examination of these figures shows that the direct competition between exports and imports belonging to the same commodity groups is dominated by our relative capital shortage and labor surplus, as is the over-all average picture of American foreign trade which we have considered before. Goods of the type requiring comparatively more American man years (but a smaller amount of capital) on the export side have a lion's share ($145 + $309 thousand) of our exports, while our competitive imports consist primarily of goods ($308 + $408 thousand) which, if they were produced at home, would absorb relatively large quantities of capital but smaller amounts of American labor. Disregarding the labor requirement entirely, we also see that commodities requiring for their production relatively small amounts of capital dominate our exports ($348 +$309 thousand) while the capital intensive commodities—irrespective of their labor intensity—are preponderant among competitive imports ($431 + $408 thousand).

Invisible in all these tables but ever present as a third factor or rather as a whole additional set of factors determining this country's productive capacity and, in particular, its comparative advantage *vis-a-vis* the rest of the world, are the natural resources: agricultural land, forests, rivers, and our rich mineral deposits. Absence of systematic quantitative information, similar to that which has been collected, organized, and used in this paper with respect to capital and labor, prevents us as yet from introducing this important element explicitly into this preliminary analysis.

However, indirect but clear signs of the influence of natural resources can easily be traced in the capital and labor input figures presented in table 2 and depicted in our graph. This influence is revealed mostly in their deviation from the dominant pattern reflecting the comparative capital shortage and labor surplus of the American economy. Without embarking on a detailed but necessarily conjectural examination of such special cases, let me point to only a few of them as seen in figure 1.

Near its lower right hand corner we find a few entries in which, contrary to the general tendency prevailing in that part of the graph, the white part of the block is taller than its black part. Consulting table 2, we find that these labor intensive and capital extensive industries showing such unusually weak position *vis-a-vis* competitive foreign imports comprise, Sawmill (37), Pottery (73), and Leather Products other than Shoes (68); all of them are based on natural materials in which the United States is obviously short as compared with the foreign countries. On the other side of the cluster among the capital intensive and labor extensive commodities of which we import as a rule more than we export, Sulphur (19), Meat Packing (21), and Grain Mill (24) products show a considerable export surplus. The United States is apparently comparatively well situated with respect to the domestic supply of such specific mineral and agricultural natural resources as are required in the production of these particular goods.

Without the necessary additional information any further pursuit of this line of reasoning is bound to become highly speculative. Conjecture about facts is intriguing but—at least in the field of economics—essentially futile in the long run. Since the facts pertaining to this particular subject are now being collected and organized, it might be well to refrain from further speculation, however tempting it may be.

VII. SOME GENERAL IMPLICATIONS

This study has been designed to ascertain the structural basis of the United States' trade with the rest of the world. We find that, contrary to widely held opinion, our exchange of domestically produced goods for competitive imports serves as a means to compensate for the comparative shortage of our domestic capital supply and a corresponding over-supply of American labor.

Without attempting a systematic exploration of the possible wide-reaching implications of these empirical findings, let me merely mention here a few questions, the answers to which might be seriously affected by the results of this preliminary investigation.

Foremost among them is the problem of the changing position of the United States in the world economy. A richly abundant supply of natural resources—as compared with capital and labor—dominated our early development and our trade relations with foreign countries up to about 1910. From the fact that at the present time capital appears to be comparatively more scarce than labor, one might surmise that this scarcity has dominated our entire economic development until now. This would mean that—in terms of a comparison with the rest of the world—our capital supply, while steadily growing, has still not caught up with the increase in our labor force, if the peculiarly high effectiveness of that labor force is taken into account. A larger supply of domestic capital, if not matched by a corresponding increase in domestic man power, will, in any case, reduce rather than increase the comparative advantage in labor supply on which our present exchange of goods and services with foreign countries seems to be based. In other words, a more rapid rise in our average productive investment per worker would diminish rather than increase the advantage derived by the United States from its foreign trade. Only a spectacular additional increase in domestic capital stock could tip the balance of comparative advantage to the other side and thus bring about conditions which by common assumption are already supposed to exist, i.e. a situation in which the United States would actually find it advantageous to use its foreign trade as a means to save American labor and to dispose of surplus American capital. In view of the determined effort of many so-called backward countries to increase their own capital stock, such tipping of the scale will take some time. On the other hand, the factors, whatever they may be, which are responsible for the peculiarly high relative productivity of American labor might soon become operative in other economies and thus accelerate the elimination of disparity between the effective comparative supply of capital and labor here and in foreign countries. This signifies, of course, a reduced incentive to the continued exchange of commodities and services between the United States and the rest of the world.

Since no discussion of foreign trade is considered to be well rounded off without some mention of free trade and protection, I conclude with an observation on that timeless subject. An increase in the United States' tariff must obviously reduce the volume of our competitive imports below what it otherwise would have been; by restricting the effective foreign demand for American goods, it would bring about also a corresponding cut in our exports. Since the exchange of goods and services with foreign countries serves as a means to relieve the pressure of our domestic labor surplus and our capital shortage, a partial closing of that valve will tend to increase such pressure. In other words, protectionist policies are bound to weaken the bargaining position of American labor and correspondingly strengthen that of the owners of capital.

A RUSSIAN TRAVELER TO EIGHTEENTH-CENTURY AMERICA

EUFROSINA DVOICHENKO-MARKOV

In their struggle for freedom, the Americans were helped by the representatives of almost every European nation: the French Lafayette, the German Steuben, the Pole Kosciuszko, and others are listed among the participants of the American Revolution, but no Russian was known by the American historians to take part in the American Revolutionary War.

The new sources found in old Russian historical magazines brought to light a forgotten story about Theodore Karjavin, a Russian traveler to Virginia during the American Revolution. Son of a rich merchant from Moscow, born in Russia in 1745, Theodore Karjavin was one of the most interesting representatives of the democratic-revolutionary ideology which developed during the eighteenth century in Russia.[1]

His father, Vasily Karjavin, considered that the progress of his country depended upon the development of commercial ties with Europe. He sent therefore, his son Theodore, to complete his education in France. In Paris, the young Karjavin entered the Sorbonne, where he received an encyclopedic education, characteristic of the Century of Enlightenment. Theodore Karjavin studied philosophy, languages, natural sciences, chemistry, pharmacology, and medicine.

During his studies, the young Karjavin was placed, as a Russian citizen, under the supervision of the Russian Minister to France, Prince Dimitry Golitzyn, who was one of the most outstanding representatives of the eighteenth-century Russian liberal-minded nobility. Prince Golitzyn was an enthusiastic disciple of the French encyclopedists and a personal friend of Voltaire and Diderot. Along with his most enlightened contemporaries, he possessed an encyclopedic education and, besides philosophy, was keenly interested in the fine arts, history, economics, mineralogy, and meteorology. Prince Golitzyn played an important role also in the French Masonic Lodge, Nine Sisters, of which Benjamin Franklin later became Grand Master. During the American Revolution, Golitzyn became an adherent of American ideas of Liberty and a personal friend of Benjamin Franklin and John Adams.[2]

Theodore Karjavin was not only under the supervision of Prince Dimitry Golitzyn during his studies, but in 1760, he became the employee of the Russian Embassy in France and, from 1760 to 1765, lived in the private house of Prince Golitzyn in Paris. The evident impact left by his enlightened patron on Karjavin's character, taste, and political views proved to be decisive for the rest of his life.

In 1765 Karjavin was called back to Russia by his father, who according to the family tradition, desired to see his son a merchant. The young Karjavin, however, preferred to be a Professor, teaching the French language at the University of Moscow and, later, opened his own private school.

In 1773, after a quarrel with his father, Theodore Karjavin decided to return to France, where he remained until 1776. During this period, Karjavin became known as a good translator and finally obtained from the French government a position as an interpreter in the city of St. Pierre on the island of Martinique. In this way, Karjavin found himself close to the events across the ocean, which stirred the imagination of the Russian people as it did the rest of the world.

Indeed, from the very beginning of the American Revolution, the cultural Russian circles devoted much attention to the struggle for freedom by the American people. The popularity of the American Revolution all over Russia was very strong. Almost everybody in that distant country desired the victory of the rebel colonies. The official spokesman of this interest was the Russian Empress, who already in 1775 refused to send her Cossacks to support the English forces against the American rebels, although the British King offered her, in case of her help, the Island of Minorca.[3] The American Revolution also greatly

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[1] Karjavin himself in his French writings transcribed his first name: *Phéodore.*

[2] Golitzyn's personal ties with America are described by Dvoichenko-Markoff, E., in: Benjamin Franklin, the American Philosophical Society and the Russian Academy of Science, *Proc. Amer. Philos. Soc.* **91**: 252–253, 1947.

[3] Renault, F., *La politique de propagande des Américains durant la Guerre d'Indépendance* 1: 97, Paris, Graouli, 1922.

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influenced and determined the ideological direction of the contemporary Russian literature, which was closely connected with the first Russian liberal movements. One of the Russian liberals of that period, the first Russian political poet and writer, Alexander Radishchev, greeted enthusiastically the realization of his ideas in the great American experiment. In his *Ode to Freedom* he expressed his sorrow to be so far from the events across the ocean and concluded his poem with the fervent prayer to be at least buried in America's free earth.

Along with his Russian contemporaries, Theodore Karjavin dreamed to take part in the American struggle for freedom, and his employment on Martinique Island made the realization of this dream possible.

Karjavin arrived in Martinique in October 1776, when the American colonies were already in close contact with the Dutch and French islands and were obtaining supplies from them. Martinique, especially, was considered as the safest place to send the American vessels. The agent for the state of Virginia, Richard Harrison, came to St. Pierre "with a special design to serve his country" and wrote, in July 1776, to the Committee of Safety in Virginia, about the population of Martinique, that "they are united in their wishes for the success of America as the Americans themselves." In the same letter, Harrison informed the Committee, that "many vessels belonging to this Island have lately sailed for the Northward and many more will shortly follow, several of them with ammunition." [4]

Among the ships from Martinique carrying supplies to the American Colonies was a vessel belonging to Mr. Lasserre, a merchant of Martinique, friend and associate of Karjavin.

In his memoirs, Theodore Karjavin indicated the date of his departure from Martinique on the ship of his associate, Lasserre: April 13, 1777.[5] The Russian source is confirmed by the petition of Lasserre to the Congress of the United States, found in *The Papers of the Continental Congress*.[6] According to Lasserre, his vessel, *Le Gentil*, left Martinique in April 1777.

On his way to Virginia, *Le Gentil* was searched by the British, who waged war on merchant ships carrying contraband or suspected contraband, whether enemy or neutral. In his memoirs Karjavin wrote, that

> near the very coast of Virginia an English King's frigate captured us and tried to convey us to the port of Halifax, but we succeeded to escape in a fog and to sail safely into Virginia after 26 days of wandering in a heavy fog.[7]

Theodore Karjavin arrived in Williamsburg in May, 1777. His statement may be confirmed by the *Virginia Gazette* (May 16, 1777), which announced the arrival of a ship from Martinique "with powder, arms, salt, etc." [8]

Karjavin and his friends from Martinique did not remain a long time in the capital of Virginia. According to Karjavin, they "traveled upon various Virginia rivers for about twenty two months," supplying the American population in various "villages and towns." [9] The *Virginia Gazette* of this period announced that Captain Laporte, a Frenchman from Martinique, with whom Karjavin was closely associated, opened, in 1778, a store in Williamsburg, where he sold rum, sugar, English cloth, men's and women's gloves and shoes, handkerchiefs, worsted stockings, and other commodities, but soon he advertised another kind of merchandise: blunderbusses, pistols, muskets, cutlasses, swords, and bridles.[10]

Captain Laporte was probably the same person, who sometimes appears as Delaporte, or Delaporte De-Crome, and who was closely associated with the project of his relative, Bajieu Laporte, "for raising a Regiment of Frenchmen in Martinique and San Domingo, to be taken into the service of the States." [11] Bajieu Laporte communicated his project to the Governor and the Council of Virginia, and a company of French troops in the service of the State of Virginia was formed. In April, 1777, The Council resolved:

> that recruiting instructions be given to Monsieur Delaporte De-Crome to enlist as many foreigners as will complite one company and that he shall receive

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[4] *Virginia Mag. Hist. and Biog.* 17: 258–259, 1909.

[5] Karjavin, Th., Zapiska o svoiej zhizni (Description of his life), *Russkaya Starina* (*The Russian past*) 1: 275, 1875.

[6] *Papers of the Continental Congress* 4: 168, Ms., National Archives.

[7] Karjavin, Th., *op. cit.*, 275.

[8] *Virginia Gazette*, May 16, 1777.

[9] Karjavin, Th., *op. cit.*, 275.

[10] *Virginia Gazette* (Purdie), May 1, 1778; (Clarkson and Davis), October 30, 1779; (Dixon and Nicolson), February 12, 1780.

[11] *Journals of the Continental Congress* 7: 342, Washington, U. S. Govt. Printing Office, 1907; *Papers of the Continental Congress* 1: 127.

a captain's command on compleating a Captain's Quota of Men.[12]

In July, 1778, the Company "being reduced by Desertions and other accidents to a very inconsiderable Number," Captain Laporte resigned his commission and obtained back from the Government of Virginia his expenses: "forty nine pounds for recruiting Men in Carolina for the Service of this state." [13] In the same year Captain Laporte opened his store in Williamsburg. The connections of Karjavin with Captain Laporte are not mentioned in his memoirs which are briefly compiled as a rather official description of his life. But an American source, the *Virginia Gazette,* which will be quoted later, showed that Karjavin lived in the house of Laporte in Williamsburg in 1779. As his stay in Virginia coincided with the organization by Captain Laporte, of the Company of French Troops in Virginia, it is possible that Karjavin took part in this affair.

In his memoirs, Karjavin wrote, that in February, 1779, he sailed from Virginia "with valuable cargo," but:

> the English captured our ship, abandoned our men on the ice over a shoal near the coast and took the ship with all my goods to New York.[14]

Karjavin does not explain what kind of goods his ship carried and why, remaining on the ice, he did not return immediately to Williamsburg. Instead, he walked to Philadelphia, then to Boston, and back to Virginia, having with him "some important papers." Karjavin arrived in Williamsburg on April 29, 1779, but, as he wrote:

> the next morning, the affairs required me to go to North Carolina, from where I just had time to return to the capital of Virginia, when the British, guided by Goodrich, arrived in the Chesapeake Bay and ascended all the rivers for pillage and destruction.[15]

Karjavin's statement on the well known Virginian loyalist, John Goodrich, is perfectly confirmed by American sources. One of them, the *Virginia Gazette* of 1779, June 19, published "an extract from a letter from Richmond county" which runs:

> A party from Goodrich privateers have done a great deal of mischief on Wicomico. burnt 2 warehouses with 400 hogtheads of tobacco in one of them, and several other houses. . . . They have killed several negroes, horses, and cattle.[16]

During the invasion of the enemy, Karjavin

> assisted the French merchant Venel, to remove by water his goods into the remote forests, where we hid ourselves until the enemy departed. Then, we returned to the capital, where I resided in the house of this merchant, departing from time to time only for the distribution of retail goods in the forest settlement.[17]

Just at that period, the *Virginia Gazette* published the announcement, which shows the direct contact of Karjavin with Laporte.

The announcement, evidently made by Karjavin, runs:

> *Wants Employ,* One that is well acquainted with the *Slavonian, Russian, French, Latin,* and some other learned languages, who is willing to act in either a publick or private capacity, and may be spoke with at Capt. *Laporte's* store, next door to Mrs. Vobe's in this city.[18]

Karjavin's announcement in the *Virginia Gazette* probably resulted in his acquaintance with Carlo Bellini, Professor of Modern Languages in the College of William and Mary in Williamsburg. Bellini was one of the professors of this College, who during the whole Revolutionary War remained in the old capital of Virginia. when the rest moved to Richmond, because of constant alarms and enemy invasions in Williamsburg.

Karjavin and Bellini became close friends. It was natural, because their education, travels, even their family situations were similar, and they had the same profession.

Breaking away from the family traditions of shop-keepers, as did Karjavin in his youth, Carlo Bellini became a professor. He traveled throughout Europe and lived in Paris at the same time as Karjavin. In 1773 Bellini emigrated to Virginia and became Jefferson's friend. In 1778 Jefferson introduced a Bill establishing the clerkship of Foreign Correspondence in the House of Delegates in Williamsburg. Jefferson undoubtedly had his friend, Bellini, in mind in proposing such a clerkship. The next year Bellini was appointed Professor of Modern Languages at the College of William and Mary.[19]

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[12] *Journals of the Council of the State of Virginia* 1: 389, Richmond, Div. of purchase and printing, 1931.

[13] *Ibid.*, 167.

[14] Karjavin, Th., *op. cit.*, 275.

[15] *Ibid.*

[16] *Virginia Gazette* (Dixon), June 19, 1779.

[17] Karjavin, Th., *op. cit.*, 276. A certain G. Venel is mentioned in the *Virginia Gazette* (Dixon) October 16, 1778.

[18] *Virginia Gazette* (Dixon), June 26, 1779.

The College of William and Mary, founded in Williamsburg in 1693, was the first in the United States to create a chair of Modern Languages in 1779. Thomas Jefferson reorganized this old institution on a modern basis, converting the college into a university, which was considered the best on the continent, its curriculum being "the most remarkable of any in the United States." [20]

The revolutionary reform, introduced by Jefferson in the organization of William and Mary College, was the beginning of the modern school system in America with a vast expansion of the modern languages and literatures.[21]

Karjavin, undoubtedly, was very interested in the history and the new organization of William and Mary College, which was realized during his stay in Williamsburg. The Faculty Proceedings of the College preserved a curious report, made in 1791, by Professor Bellini:

> that the original charter of this college which is lost, was some years past seen by him in the possession of a certain Karjavine, a native of Moscovy, who declared it was his intention to deposit the same among the archives of St. Petersburg in Russia.[22]

In addition to common cultural and professional interests, another powerful link tended to draw Karjavin and Bellini closer together. They both were free-masons. The College of William and Mary was in close connection with the Masonic Lodge of Williamsburg. During the period of 1773 to 1780 five Faculty members, among them Carlo Bellini, were in regular attendance of the Lodge.[23]

In Russia, Freemasonry, which played a great part in the social and intellectual development of the country, was closely linked with the humanistic aspect of Russian liberalism and with pro-American feelings in the Russian Society. Being under the influence of such a great Mason, as Prince Dimitry Golitzin, Karjavin certainly was introduced into this organization before his visit to America. When he returned to Russia, he dedicated one of his books to his Virginian friend, Bellini, and in his dedication clearly showed, by some Masonic expressions, their mutual connection with that secret but powerful organization of the eighteenth century.

The book, dedicated by Karjavin to Bellini, was written in 1789 under the evident influence of the French Encyclopedists. Its title was:

> *Déscription du pou, vu au microscope.*
> *En français et en russe. Par Phéodore*
> *Karjavine. Me. de pension de l'université*
> *de Moscva, avec figures.*
> *A Carouge. De l'Imprimerie*
> *de Jean Thomas, Imprimeur du Roi.*
> M. DCC. L XXXIX [24]

The book contained, among others, the results of the observations made by Karjavin during his stay in America. So, for instance, describing the human hair, Karjavin wrote:

> Les poils qui couvrent le corp humain dans les deux sexes, ne diffèrent en rien de la nature des cheveux même dans les Nègres.[25]

Another reference of Karjavin to America runs as follows:

> Non seulement le Singe et la Macaque, mais aussi les Nègres et plusieurs autres peuples dits sauvages,[26] que j'ai vus douze ans en Amerique, mettent volontiers un Pou sous la dent et le mangent.[27]

But the most important part of Karjavin's book, which showed his close connection and friendship with Professor Carlo Bellini, is the dedication. Here is the complete text:

A Monsier C. Bellini,
Profésseur a l'Université de Williamsburg en Virginie.
Monsieur et ami!

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[19] The information on C. Bellini was gathered mainly from the biographical sketch by Branchi, E., found in the manuscript collection of the Library of William and Mary College as well as from the article of A. Pace on C. Bellini (*William and Mary Quart.* 4: 350–355, 1947).

[20] *William and Mary Quart.* 1: 240, 1896; 176, 180, 1898.

[21] Castaneda, C., *Modern language instruction in American colleges, 1779–1800,* 9, Washington, National Capital Press, 1925.

[22] *William and Mary Quart.* 27: 233, 1919.

[23] *Ibid.* 1: 15, 1892.

[24] *The description of lice seen through a microscope. In French and in Russian. By Pheodore Karjavine. Instructor at the Junior College of the Moscow University, with illustrations.*
In Carouge, From the Printing House of Jean Thomas, the Printer of the King.
M. DCC. L XXXIX.

[25] The hair that covers the human body of both sexes is not any different from the nature of hair found on the Negroes.

[26] In addition to this in the Russian text "Indians" are mentioned.

[27] Not only the monkeys, but the Negroes too and many other peoples called savages, whom I have seen during the twelve years in America, voluntarily place a louse under the tooth and eat it.

> Du fond des Climats Hypérboréens de l'ancien monde j'offre à un SAGE du nouveau, l'explication d'une planche faite autrefois pour l'Encyclopédie in-folio: elle ne represent qu'un Pou; mais c'est un Pou raisonné. Je vous l'offre en ami sachant que rien n'est vil aux yeux d'un Philosophe. Les Œuvres du grand Architecte sont variées a l'infini, in mininmis creaturis quam potens quam mirabilis DEUS! Recevez ces lignes comme une marque de l'union intime qui éxiste entre les vrais—croyans malgré l'immensité des Mers qui les séparent.
>
> J'ai l'honneur d'être,
> Monsieur et ami;
>
> Votre trés affectionnné serviteur.
> Ph. K.[28]

The result of Karjavin's announcement in the *Virginia Gazette* was not only his friendship with Carlo Bellini, but, probably with the aid of the latter, his contact with the officials of the State of Virginia. In 1785, Karjavin wrote to his father:

> Six or seven years ago I lived in Williamsburg in the service of the Virginian government for about six months, being intended to be sent to the Russian Empress from the American Congress as a public representative. It was at the same time when the Americans sent Doctor Franklin to the French King as a plenipotential Minister.[29]

The historical importance of this information, given by the Russian visitor to Virginia is evident. American history knows only one abortive attempt to send the representative of the young American Republic to Russia. It was in 1781, when Francis Dana of New England was sent by the American Congress to St. Petersburg Imperial Court. Karjavin's statement, however, establishes the date of an earlier plan in 1779. The possibility is not to be excluded that this project to send Karjavin to Russia was proposed by Jefferson, then Governor of Virginia and later the initiator of several missions to Russia in the eighteenth century. Karjavin felt that it was not proper for him to represent the American Republic in his native country. Therefore, he declined this honor preferring probably to help again the revolutionary colonies from Martinique. He left Virginia on January 25, 1780. In his memoirs he wrote:

> With the recommendation of the French Consul and with the French passport I sailed on a seventy four gun French ship from York and after twenty days travel we arrived at Martinique, having suffered at the entrance into harbor a cannonade of the whole British fleet. The Commandore of this ship was Marquis de Vaudreuil.[30]

The American sources confirm that the Marquis de Vaudreuil was captain under D'Estaing, of the ship *Le Fendant,* which was in York harbor from the twentieth of November, 1779, until the twenty-fifth of January, 1780—the date shown by Karjavin as his departure.[31]

It may be estimated that from Martinique Karjavin continued his contact with Virginia. In his *Mémoirs* he mentioned that, from September, 1781, he has been associated with the French merchant of Martinique, Dalton, the owner of the ship which carried different supplies. Dalton was, probably, the same person who was mentioned, in 1776, in the Journals of the Committee of Safety of Virginia, in connection with Richard Harrison, the Virginian agent on Martinique. The Committee

> ordered that a Duplicate of the letter lately sent to Richard Harrison Esquire of the Island of Martinico, with the several resolutions enclosed, be sent to John Dalton Esquire of St. Pierre in the said Island of Martinico.[32]

When, in February, 1782, Dalton sold his ship, Karjavin sailed again to Virginia on an American vessel. Near Puerto Rico the ship was captured by the British caper *Amazon,* and Karjavin became, together with the Americans, a prisoner of war. Only after the end of hostilities was he able to return to Virginia. In his *Mémoirs* he wrote:

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[28] Burtsev, A., *Opisaniye redkikh rossiiskikh knig* (*The Description of Rare Russian Books*) 3: 556, St. Petersburg, 1901.

To Mister C. Bellini,

Professor at the Williamsburg University in Virginia.

Sir and friend!

From the depths of Hyperborean Climates of the old world I am offering to a SAGE of the New World the explanation of a plate made once for the Encyclopaedia infolio: it represents only a louse, but a louse that was studied. I am offering it to you in friendship knowing that there is nothing insignificant for the eyes of a Philosopher. The creations of the great Architect are variable to the infinite, how great, how marvelous God is in the smallest of creations! Receive these lines as a mark of the intimate union that exists between true-believers despite the immensity of the Seas that separate them.

I have the honor to be,
Sir and friend!

Your very affectionate servant,
Ph. K.

[29] Karjavin, Th., *op. cit.,* 280 (note).

[30] *Ibid.,* 276.

[31] *Papers of Thomas Jefferson,* J. P. Boyd and L. H. Butterfield, 3: 210–211 (note), Princeton Univ. Press, 1951.

[32] *Journals of the Council of the State of Virginia* 1:24.

> On September 4, 1784, I found myself in New York, from where, through Philadelphia, I went to the very place, where, during my former visit, I attended the American school near the city of Smithfield. Here I practiced medicine for seven months.[33]

In April, 1785, Karjavin, being dissatisfied with monetary returns in Smithfield, decided to go to Williamsburg. Here he remained almost two years. He wrote in his memoirs that in May, 1785,

> the French merchant, La Croix, departing to France, entrusted me with his home and trade, and the French Consul, Mr. Oster, appointed me in his office, as a translator for French and American affairs.[34]

The *La Croix House,* built in 1754 by John Palmer, is well known in Williamsburg. The French merchant, Pierre de La Croix, purchased the house in 1782.

From the American sources we learn that the French Consul in Virginia, Martin Oster, in 1785, April 22:

> announces to Governer Henry his appointment as French Consul, and requests the fact be made public as soon as practicable.[35]

Karjavin sent with La Croix a letter to the Russian representatives in France, asking them to procure for him money to return to Russia. "The desired answer from Europe" came only at the beginning of 1787, when Karjavin decided to leave Virginia, at that time—forever.

Altogether, Karjavin spent more than four years with interruptions in Virginia. He never forgot his exciting American experience, his exalted friendship with Carlo Bellini, and the part he took in the struggle of the American people for freedom.

After his return to Russia, Karjavin joined the liberal group of the Russian writers and was in close contact with Nikolay Novikov, the most outstanding representative of the early Russian literature, influenced by the American ideas of liberty.

Novikov was one of the first promoters of the publishing business in Russia. He edited over nine hundred books in various fields, among them numerous works about America and the American Revolution. Novikov's journalistic activity embraced several magazines which greatly influenced the development of the Russian public opinion. Taking into consideration the growing interest of the Russian people for the political thought in general and particularly for the young republican America, Novikov in his journals and editions paid great attention to the events across the Ocean. He dedicated to America special sections in his journals, and their supplements contained such articles as "News about Pennsylvania," "About the province of Virginia,"[36] the biographies of the heroes and sympathizers of the American Revolution, etc.

In Russia, with the help of Novikov, Karjavin published several books and translations under his own name as well as under pseudonyms. One of the pseudonyms used by Karjavin was: "A Russian-American," a fact which shows that even back home in Russia Karjavin considered himself not only a Russian, but also one who by the virtue of his activity in America during the American struggle for freedom deserved to be also an American citizen.

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[33] Karjavin, Th., *op. cit.,* 277.

[34] *Ibid.,* 278.

[35] *Calendar of Virginia State Papers* 4: 25, Richmond, W. P. Palmer and S. McRae, 1884.

[36] *Primechaniye k Moskovskim Vedomostyam (Supplement to the Moscow News),* (no) 76: 577, 1784.

SIDE LIGHTS ON COSMIC CHEMISTRY

PAUL W. MERRILL

Mount Wilson and Palomar Observatories

(Read April 24, 1953)

To SEE the various parts of the astronomical universe in true proportion one might wish for a vantage point outside, or at least at the edge of, the realm of the major structures. Instead we are well within one small unit, the Milky Way system, looking out into a complicated array of stars, nebulae, and galaxies. In studying the spatial structure of the observable universe, our location has had some disadvantages. It took a long time and much effort to recognize even the main features of the geometrical organization. Except for objects in the solar system and for a few of the nearer stars which can be triangulated from opposite sides of the earth's orbit, our knowledge of astronomical distances rests on laborious statistical determinations and has been rather unreliable in some particulars. For example Baade and others have recently come to the conclusion that galaxies are actually about twice as distant and twice as big as astronomers formerly thought. There still exists considerable uncertainty in data concerning the average luminosity and thus the average distance of certain classes of objects.

In studying the chemistry of the stars the situation is quite different. Here the spectroscope is so powerful that distance causes relatively little difficulty. As an illustration of its power, recall the fact that in the laboratory where a chemist can handle material and put it in a test tube he often prefers the optical method. Instead of subjecting the sample to reagents he will frequently put some of it in an electric arc or spark, whereupon after thus committing the chemical information to light-waves he then operates in the same way as an astronomer; both must collect some light—one from a laboratory source, the other from a star—and send it into a spectroscope. Now light waves can record an immense amount of chemical and physical data; moreover they are speedy and untiring and have a perfect memory, being able to travel for years, even for millions of years, without forgetting a single detail. True the reports become fainter according to the law of the inverse square, but they remain distinct and when recorded on a photographic plate are still legible. And a large telescope counteracts faintness due to distance. Thus an astronomer can analyze a star just as if a bit of it were in the laboratory a few feet away. What are a few light-years between friends? And provided the telescope can gather enough light, distance does not reduce the accuracy of analysis. The purpose of this introduction is to emphasize the fact that, thanks to the spectroscope, our knowledge of cosmic chemistry is today more comprehensive and more precise than our knowledge of the spatial structure of our own Milky Way system and of the galaxies that lie beyond its borders.

The first connection between astronomy and chemistry occurred in the ancient days of the Chaldeans when learning seemed to be based on mythology or rhetoric as much as on facts. The seven major bodies in the solar system were identified with the seven chemical elements then known; and they bore the same names in pairs as follows:

Sun	Gold
Moon	Silver
Mercury	Mercury
Venus	Copper
Mars	Iron
Jupiter	Tin
Saturn	Lead

The only example to survive in English is Mercury.

In the first half of the nineteenth century there came a belated reaction to ages of superstition and vague rhetorical pseudo-knowledge. Philosophers, particularly the French encyclopedists, tried to outline all definite current knowledge and all possible future knowledge. In a third category—the forever unknowable—they placed the chemical composition of heavenly bodies. This period of professed ignorance ended abruptly in 1856 with the enunciation by Kirchhoff and Bunsen of the chemical principles of spectroscopy. These men opened the door to chemical analysis of the heavenly bodies—something declared forever impossible only a few years before by the famous philosopher Auguste Comte (1798–1857).

A systematic description of what has been learned since 1856 about cosmic chemistry would be far too long to present here; a few side lights only are possible.

For many decades the "new" astronomy was concerned with the identification of chemical elements in sun and stars, in short with what in the laboratory would be called *qualitative* analysis. It was soon proved that many of the more abundant terrestrial elements were present in the heavenly bodies. Then came the question, "Do the heavens contain any chemical substances not found on earth?" For a long time the answer seemed to be, *"Yes."* In 1864 the great English pioneer astrophysicist, Sir William Huggins, discovered that certain bright areas in the sky like the great nebula in Orion were actually clouds of glowing gas and moreover that they yielded certain spectrum lines not matched by any substance examined on earth. The hypothetical element supposed to produce the strange radiations was named nebulium. Then as knowledge of physics and chemistry advanced, astronomers began to suspect that the unknown radiations should be ascribed not to strange atoms but to familiar ones shining under circumstances differing from those in laboratory experiments. Finally in 1928 when laboratory spectroscopy had revealed the electronic structure of various atoms, a member of this Society, Dr. I. S. Bowen was able to show that the "nebulium" lines are produced by oxygen atoms twice ionized in a gas so tenuous that the atoms have much longer intervals between collisions than in laboratory sources, and thus have sufficient time in which to emit certain characteristic radiations. Many other lines previously unidentified soon found similar interpretation.

A number of lines, especially in the spectra of long-period variable stars, are still enigmatic but it is unlikely that they represent non-terrestrial elements. There does appear to be in S-type stars one element which does not now exist naturally on earth although it has been produced artificially. This is element number 43, the metal technetium, made by bombarding molybdenum, the preceding element in the periodic table, in the cyclotron at Berkeley and first identified in 1937 by Perrier and Segre.

One of the most challenging problems of present day astrochemistry concerns the chemical nature of the dust of interstellar space. Six or eight spectrum lines absorbed by this material are known, one of them very diffuse, the others slightly so. They are probably due not to some very rare element but to an abundant compound; hence it is strange that they cannot be identified. If the lines are actually due to solid particles in interstellar space, it may be that they are reasonably narrow only at very low temperature, and thus have not as yet been recognized in our laboratory results which of course are obtained mostly at room temperature. The answer may eventually come from a cryogenic laboratory through noting the absorption features of common substances at very low temperatures.

In 1929 Russell made a preliminary *quantitative* analysis of the sun's atmosphere, following which many investigations of this type have been made on other stars and on gaseous nebulae. Thus we are now in a phase of cosmic chemistry in which *quantitative* analysis is emphasized. Here the interpretation of spectroscopic data presents considerable difficulty and many important results are as yet tentative. Some general conclusions, however, are quite definite.

Hydrogen is so abundant that to a first approximation the universe consists wholly of that element. Next comes helium. It is estimated that these two elements account for perhaps 98 per cent of all matter, leaving only about 2 per cent for all other elements. The light elements hydrogen, helium, and neon are much more abundant in the stars than on the earth, while the heavier elements in general exist in more nearly terrestrial proportions. The sun appears to be a rather good chemical sample of the universe.

One of the main problems of quantitative cosmic chemistry concerns the trifurcation of the cool end of the temperature sequence of stars. The three types of red stars, M, S, and N, have spectra marked respectively by titanium oxide, by zirconium oxide, and by carbon compounds. In M-type stars the proportions of the various elements are probably much the same as in the sun; in S-type stars the heavy elements from strontium, number 38, on, including the rare earths, seem relatively abundant; while in N-type stars carbon and cyanogen molecules are very prominent, possibly because of lack of oxygen.

In conclusion, another and comparatively recent phase of cosmic chemistry may be mentioned—the study of element building. Why do the atoms now have the observed forms and relative numbers? Continuous creation of matter at just the right rate to balance that lost by expansion, keeping the universe in a steady state, is, according to Hoyle, a possibility that should be borne in mind. But Gamow and others believe that chemical and astronomical facts point back toward a condensed primeval chaos with temperatures of billions of degrees followed a few billion years ago by a rapid expansion, freezing the species and numbers of atoms as we now know them and leaving us with a universe which is still expanding.

MEMOIR OF WILLIAM COWPER

An autobiography

Edited With An Introduction By

MAURICE J. QUINLAN

Professor of English, College of St. Thomas

PREFACE

In the late spring of 1763, at the time when James Boswell was first cultivating the acquaintance of Dr. Johnson, there was living in London, just a few doors from Johnson's chambers at No. 1 Inner Temple Lane, a harassed young man by the name of William Cowper. Through the influence of relatives he had recently been appointed Clerk of the Journals in the House of Lords, a position for which his training in the law would seem to qualify him. An unforeseen obstacle appeared, however, when political opponents of the Cowper family demanded that the candidate prove his abilities by submitting to an oral examination before the bar of the House. This challenge profoundly disturbed the shy and extremely sensitive young man. His faltering and confused attempts to prepare himself only increased his sense of dejection, and at length, as a means of escaping his predicament, he attempted suicide. By the end of the year his mental condition had become so grave that he was committed to an asylum for lunatics.

Johnson and Boswell had probably never heard of Cowper during his residence in London, but the former Templar, though handicapped by recurring attacks of insanity, was eventually to emerge from obscurity and to become one of the best-known poets of the age. Although Boswell never met him, he came to know the poet by reputation, and on February 26, 1791, he recorded an interesting piece of gossip in his *Journal:*

> Dined at Mr. Dilly's. Mr. Sharpe joined us after dinner. He was acquainted with Cowper, the Poet, his account of whom was frightful, for with a great deal of genius and even pleasantry, he has at bottom a deep religious melancholy, to divert the shocking thoughts of which he is now translating Homer. He has been woefully deranged—in a strait waistcoat—and now is sometimes so ill that they take away his shoebuckles that he may have nothing within his reach with which he can hurt himself. It seems he apprehends himself to be in a state of *reprobation,* being impressed with the most dismal doctrines of Calvinism. I was quite shocked to hear of such a state of mind. My own was good by comparison.[1]

Good by comparison, for the famed biographer, like his friend Dr. Johnson, periodically suffered from melancholia. The chief difference was that Boswell and Johnson maintained the perilous balance that kept them within the borders of sanity. Cowper, though sane for several years at a time, was plunged into madness upon at least four different occasions.

The "Age of Reason" seems almost an ironic sobriquet for the eighteenth century in view of the number of distinguished persons afflicted by insanity in that period. One thinks immediately of literary figures like Swift, Collins, and Smart, but the same tendency to mental instability existed among the artists. Of the three who painted portraits of Cowper, two, Lemuel Abbott and George Romney, became deranged. The most famous victim of all, of course, was George III. So prevalent was a disposition to melancholy among the British upper classes that it came to be known as the *English Malady*. This term, though employed derisively at first, gained wide and reputable usage after Dr. George Cheyne published a serious work on mental diseases called *The English Malady*. In his preface the doctor remarked, "The title I have chosen for this treatise is a reproach universally thrown upon this island by foreigners and all our neighbors on the Continent by whom distemper, spleen, vapours, and lowness of spirits are in derision called the ENGLISH MALADY." Having himself been a victim of this disease, the doctor added somewhat ruefully, "I wish there were not so good grounds for this reflection." [2]

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[1] *Private papers of James Boswell from Malahide Castle,* ed. Geoffrey Scott and Frederick Pottle, 18: 110, Mt. Vernon, N. Y., 1934.

[2] George Cheyne, M.D., *The English malady,* Preface, London, 1733.

We need not be concerned with the various case histories which Dr. Cheyne includes in his volume or with his remedies—salts, medicine, diet, and exercise. Like most of his contemporaries, the doctor had but a very limited knowledge of the nature and causes of mental disease. It is interesting, however, to observe his reasons for believing that the English Malady was particularly associated with the time and the conditions under which the British were living. He writes,

> The moisture of our air, the variableness of our weather (from our situation amidst the ocean), the rankness and fertility of our soil, the richness and heaviness of our food, the wealth and abundance of the inhabitants (from their universal trade) and the inactivity, and sedentary occupations of the better sort (among whom this evil mostly rages) and the humour of living in great, populous and consequently unhealthy towns, have brought forth a class and set of distempers, with atrocious and frightful symptoms, scarce known to our ancestors, and never rising to such heights, nor afflicting such numbers in any other known nation. These nervous disorders being computed to make almost one third of the complaints of the people of conditions in England.[3]

Was there actually a greater incidence of neurosis and insanity among the upper classes than in earlier times? In the absence of statistics one cannot be certain, but it is at least possible. The eighteenth century was a period of change, and perhaps the doctor was partly right in his conjecture that melancholia had increased with urban living and a trend toward more sedentary occupations. But another reason may have been more important. It is noteworthy that the mental depression of Johnson, Boswell, and Cowper was largely the result of religious doubts, scruples, and conflicts. Many, it would appear, suffered from a fear of ultimate damnation. While this prospect has harassed Christians at all times, it may have been stronger in an age when Calvanism, though no longer the positive force it had once been, still cast a lingering shadow of doubt and despair over the minds and hearts of men.

One of the most pitiable of all the victims was William Cowper. Even after an interval of nearly two hundred years the account of his mental collapse provokes in the reader a sense of wonder at his strange tale and a feeling of sympathy for his sufferings. The story is the more poignant because it is one of the few instances in which the victim himself records the details of the loss and recovery of reason. Cowper never wanted his *Memoir* to be published. He wrote it with the intention of showing it to a few friends, but, as so often happens, the manuscript survived the man, and sixteen years after his death two different editions of the *Memoir* appeared. During the next few decades the little volume was reprinted several times in England and America, but no edition has been published in the past century. Consequently the *Memoir* has become a rather rare item. It is here printed to make it available to students of the eighteenth century and in the belief that many others will find it a fascinating case history from a former age.

William Cowper was born November 26, 1731, at Berkhampsted, Hertfordshire, where his father was rector of St. Peter's Church. His mother, a descendant of the poet John Donne, died when the boy was six. For two years Cowper attended a school directed by a Dr. Pitman. Here, he observes in the *Memoir,* his life was made miserable by the cruelty of the other boys. He seems to have been more happy at Westminster, the famous London school at which he was enrolled from the age of ten to eighteen. Upon leaving Westminster, he studied law for three years with a London attorney. He was called to the bar in 1754 but never engaged in the legal profession. Having a modest income, for the next ten years he lived in chambers at the Temple, enjoying the companionship of other young men, studying the classics, and writing occasional verses.

An important event of this period, although he does not mention it in the *Memoir,* was his engagement to his cousin Theodora Cowper. The record of the courtship exists chiefly in the poems he addressed to her. The marriage never took place, for her father, probably disapproving of a union between cousins, broke off the engagement. No doubt the loss of Theodora was a painful blow to the sensitive young man, but his disappointment in love apparently had little bearing on the attack of insanity that ensued six years later.

The *Memoir* supplies a fairly detailed record of the years 1763–1765. During that period Cowper lost his reason, recovered it at the asylum of Dr. Cotton, and then settled in Huntingdon. The account ends at the point where he has just taken up his residence with the Unwin family. A year later the Reverend Morley Unwin was killed in an accident. Cowper, having found sympathy and companionship with this family, decided to continue his existence with them. They now had no reason for remaining at Huntingdon, however, and, because the situation of a bachelor living with a widow only seven years his senior had given rise to gossip, they looked for a home elsewhere. In September, 1767, they moved to Olney, a lace-making town situated on the Ouse River.

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[3] *Ibid.*

At Olney, Cowper's chief male companion was the Reverend John Newton, an Evangelical convert who had entered the ministry late in life, after a youth spent at sea as captain of a slave ship. Many have thought that the Calvinism of this robustious clergyman had a disturbing influence on Cowper, but the poet had been a Calvinist before he met Newton. If the friendship did contribute to the second attack of insanity, more likely it was the strong-willed personality of the clergyman, and not his doctrines, that adversely affected the sensitive younger man. Cowper's doubts had started to reappear before he left Huntingdon. During his early years at Olney his conflicts deepened, and in 1773 he once more lost his reason. Again, as during the first period of insanity, he had hallucinations. In one of these he thought he heard a supernatural voice commanding him to take his life. He again attempted suicide but failed. According to two of his clerical friends,[4] this failure caused him to develop, for the second time, a conviction that he had committed the unpardonable sin. This time he thought he was damned for not carrying out the command to destroy himself. After a few years of profound melancholy, he regained his sanity, except for the curious delusion that he was irrevocably damned. This conviction was to remain with him for the rest of his life.

In 1780 Newton left Olney to accept the living of St. Mary Woolnoth Church in London. Shortly thereafter, at Mrs. Unwin's suggestion, Cowper began composing a moral satire entitled *The Progress of Error*. When this was finished he was so pleased with his efforts that he wrote seven other didactic poems in iambic pentameter couplets. These verses were included in a volume that appeared in 1782. Having discovered that writing was the best means at his command to shut out his more gloomy thoughts, Cowper now devoted a part of each day to composing verses. A fresh influence came into his life in 1781 when Lady Austen, an Evangelical widow who had lived much in France, came to the Olney region. She delighted the middle-aged bachelor with her pleasant talk, encouraged his verse-making, and suggested various subjects for poems. Under her influence he produced some of his best work. The friendship with the somewhat flirtatious lady ended in a few years, chiefly because she and Mrs. Unwin could not share their devotion to Cowper. Lady Austen's influence was, however, reflected in *The Task* and in the other poems published in 1785. This volume made him, at the age of fifty-four, the most esteemed poet of the time.

For the next six years he was occupied with blank verse translations of the Iliad and the Odyssey. His Homer, published in 1791, was received with respect but added little to his reputation. A third attack of insanity, lasting six months, had occurred in 1787. From this Cowper made a rapid recovery, and his mind remained clear for the next four years. Then, worried by the failing health of Mrs. Unwin, he grew increasingly depressed. In 1793 he sank into a state of melancholia from which he never recovered. The poet's young cousin, the Reverend John Johnson, finally brought the aging couple to Norfolk to care for them. Mrs. Unwin died there in 1796. Cowper survived until April 25, 1800.

In his letters Cowper generally referred to his manuscript as a *narrative*. The term *Memoir* was a coinage, and not a very appropriate one, of the first publishers. What Cowper wrote was really an autobiographical sketch of a period in his life, but I have deemed it unwise to change the title under which it has always appeared. The *Memoir*, in addition to the light it throws on the poet, remains significant for two reasons—first as a rare personal record of the loss and recovery of reason, and secondly as an interesting account of a spiritual change, in this instance conversion to eighteenth-century Evangelicalism.

Cowper's narrative was composed at a time when doctors knew little about insanity and when many uneducated laymen still thought of a maniac as one possessed of devils. It is not surprising therefore that the poet reveals a great deal of naiveté about the nature of his mental disease. Writing a few years after his recovery, he seems incapable of understanding that the voices he heard in his delirium were hallucinations and that his various attempts to commit suicide were frustrated, not by the specific reasons he assigns, but by his basic reluctance to take his life. In the *Memoir* he pictures himself as lacking almost entirely freedom of choice. His evil impulses are all prompted by the devil, and his good impulses are monitions from heaven. This tendency to describe himself as a helpless victim of supernatural forces was owing in part to his Calvinistic religious beliefs. But it was more than that. It seemed to be the nature of the man to suppress self, to distrust his own reasoning powers, and to put faith in the validity of dreams and illusional voices. At a later period this peculiar trait led to such mental confusion that he came to believe that the voice of God had commanded him to take his own life, a conviction that nothing could shake, even after he had in other respects regained his sanity.

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[4] John Newton, quoted by Robert Southey, *Life of William Cowper* 1: 188, Boston, 1839; Samuel Greatheed, *Gospel Magazine and Theological Review* 5: 437, Nov. 1800.

The *Memoir* provides rather full details of the circumstances leading to his mental breakdown, but modern readers will feel that something more than ordinary shyness led him to attempt suicide rather than face an examination, and that something more than fear of having committed the unpardonable sin was at the root of his deep sense of guilt. The real cause of his insanity will probably never be known, but there were undoubtedly underlying influences of which he was either not aware or else suppressed. There is some evidence that a physical abnormality may have played a part in the first and subsequent attacks of insanity. After his death two of his friends of later life alluded to a constitutional defect, and one of them, the Reverend John Newton, implied that an abnormality of the sex organs was responsible for Cowper's fear of taking an examination before the bar of the House and for his later periods of madness.[5] An unusual condition of this kind might explain other aspects of his later life, such as his failure to marry Mrs. Unwin, to whom he became engaged. But we shall probably never have any more evidence than is now available, and Newton's statement is too vague to form a basis for definite conclusions.

If the *Memoir* does not give the whole truth or even a very clear view of the way Cowper must have appeared to his friends, it is nevertheless one of the most interesting of self-portraits. In this respect it may be compared to the various pictures of the artist painted by Van Gogh, a man who resembled Cowper in his sensitivity, his suicidal tendencies, and his recurring insanity. In Van Gogh's self-portraits it is not fidelity to the model that one admires but the compelling projection on canvas of the distraught mind of the artist. In the *Memoir* it is not the sweet-tempered, gentlemanly poet described by his friends that emerges. Rather it is the anatomized view of a guilt-ridden young man, torn by conflicts, desperately trying to escape by suicide and each time thwarting his own attempts, and finally driven to madness.

The *Memoir* is also a story of a remarkable religious conversion following upon a curious religious obsession. Although we do not customarily think of the eighteenth century as a great religious age, one of the most important events of that period was the Evangelical revival started by John Wesley. The revival had been in progress several decades at the time Cowper was converted. Thousands of adherents had already embraced Methodism, and many others, though they remained in the Established Church, had been converted to the doctrine of salvation by faith alone. The Evangelicals, no matter to which denomination they might belong, thought of conversion as something more than a turning to God; to them it meant a distinct and often dramatic religious awakening of the soul through a process called the new birth. Generally some stimulus served to rescue the sinner from religious apathy and start him on the road to conversion. Hearing a sermon, reading the Bible or a tract, or experiencing an event out of the normal course of affairs were the common means of arresting attention and focusing it on the subject of salvation. Thereafter the sinner went through the following stages, though often his conversion was so sudden that the steps occurred simultaneously: (1) consciousness of personal sinfulness; (2) a turning to God; (3) an awakened sense of God's mercy; (4) a heartfelt realization of the significance of the Atonement; (5) belief in the principle that man is saved by faith alone; and, finally, (6) assurance of one's own salvation.

To the Calvinist, and Cowper was a Calvinist, man has no merit of his own. He possesses no quality that can help towards his salvation, because he lacks freedom of the will and is by nature totally depraved. Consequently he must remain a sinful creature until the grace to believe in his own salvation descends upon him. The Evangelicals could find no term entirely adequate to describe the state of human iniquity and abasement. The nearest equivalent for unregenerate man was to call him "a worm," a term that Cowper frequently employs in his verse. Once a man had been converted, on the other hand, he would renounce sin, and, when tempted, find additional strength in his faith to put temptation aside. Furthermore, since he was now a saint, his thoughts would be directed to holiness and so much concerned with the life to come that the world with its pomps and vanities would have little appeal for him. Needless to say, it was no easy task for mortal man to maintain this degree of perfection. The sense of elation which followed upon Cowper's conversion lasted a few years. Then doubts began to assail him, and when he lost his assurance of salvation, he again lost his reason. His convictions were strong, however, at the time he wrote his *Memoir,* and though his ecstatic joy appears somewhat fanatical, no one can doubt his sincerity.

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[5] *The Greville Memoirs, 1814–1816,* ed. Lytton Strachey and Roger Fulford, 3: 85, London, Macmillan, 1938.

When Cowper composed his *Memoir* he had but one object in mind—to awaken others from darkness of soul or, as he said, "to teach the Sovereignty of God's free grace in the deliverance of a Sinfull Soul from the nethermost Hell."[6] Thus his autobiographical sketch was to serve the same purpose as the numerous spiritual biographies which appeared in the Evangelical periodicals or were circulated as tracts. One of the most famous of these was the *Authentic Narrative* of John Newton. This description of the conversion of a hardened and sinful sailor and of his transformation from captain of a slave ship to Evangelical clergyman appeared in 1764. Cowper did not meet Newton until a few years later, but he had probably read the *Authentic Narrative* before writing his own *Memoir.* A few years later he composed a short work called *Adelphi,* in which he told the story of the death-bed conversion of his brother, John Cowper. The poet also had a hand in revising Thomas Scott's *Force of Truth,* one of the most forceful examples of Evangelical biography.

Like most Evangelical literature the numerous tales of conversion are now almost completely neglected. Most of them were written by sincere but untalented disciples whose fanaticism is distasteful to modern readers. Sudden conversion, however, especially when told with the directness of St. Paul, can be highly dramatic material. Occasionally the rapture of the eighteenth century convert imparts an unusual vigor to his story. Thomas Scott, for instance, has an appealing forthrightness in passages such as the one in which he describes his narrative as containing "little more than the history of my heart, that forge of iniquity, and of my conscience, that friendly but too often neglected monitor."

Cowper's *Memoir* is a much more compelling document than most of the Evangelical personal histories, but it resembles them in being singularly unobjective. Perhaps, as some writers have suggested, he was not completely cured of insanity when he composed it. But the simpler explanation is that he was merely following the pattern for spiritual biography when he emphasized the sinfulness of his early life, attributed all his misfortunes to his evil nature, censured worldly life in the strongest terms, and, after his conversion, described himself as entirely devoted to a pious existence.

The *Memoir* was written at Huntingdon, shortly after Cowper went to live with the Unwins. He may have started it at the end of 1765, but he probably wrote most of it in 1766. In addition to being more interesting, it differed in one other respect from most Evangelical narratives of conversion. The typical account was designed to reach a large audience through publication. Cowper's manuscript, because of the details of his insanity and the extreme sensitivity of the author, was intended for only a small circle of relatives and friends. The Unwins were undoubtedly the first to see it, and after them his good Evangelical cousins, the Madans. Then Lady Hesketh, the sister of his old love Theodora, having heard of its existence, asked permission to read it. Cowper sent her the manuscript somewhat reluctantly, feeling that she was a little too worldly to understand the nature of his religious experience. Her reaction confirmed his fears. Although moved by the account of his suffering, she was disturbed by the fanatical tone of self-condemnation and intimated as much to him. Disappointed at his failure to awaken her religiously, Cowper wrote Mrs. Madan that he had previously thought his narrative "unfit to be trusted in the hands of an unenlightened Person, the Lord having dealt with me in a way so much out of the common course of his proceeding, nor do I intend that any such shall hereafter read it."[7]

Cowper later showed the *Memoir* to his brother, to Newton, and to a few other friends, but he was determined never to allow his own narrative or the story of his brother's conversion to be printed. According to T. S. Grimshawe, one of the poet's early biographers, Cowper did permit Newton and his young cousin, John Johnson, to make transcripts of the *Memoir,* "but these parties were strictly enjoined never to allow another copy to be taken."[8] Despite this precaution, Newton apparently let his copy circulate, for in 1774 his wife wrote from London, asking him to send it to her in order that she might show it to a "learned lady."[9]

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[6] *Unpublished and uncollected letters of William Cowper,* ed. Thomas Wright, 27, London, Farncombe, 1925.

[7] *Ibid.*. 29.

At least one copy of Newton's manuscript seems to have been made surreptitiously. The culprit, according to Grimshawe, was a woman who had recently recovered from a mental derangement. While visiting Newton, and while he was out of the room presumably, she saw the narrative lying on a desk among other papers. Impressed by the strange account—and having, perhaps, a tendency to kleptomania—she borrowed it long enough to make a private copy which she then allowed friends to see.[10] This may have been the source from which further duplicates were made. In any event the number of transcripts multiplied, for when the printed text eventually appeared, one editor observed that manuscript copies were in the hands of several eminent persons.[11]

The *Memoir* was first printed in 1816 under circumstances that present an interesting and puzzling bibliographical problem. In the first place two different texts of the *Memoir* appeared in that year under the aegis of different publishers. Neither editor revealed his identity, but, as differences in the printed texts indicate, each must have had his own manuscript of the *Memoir*. Furthermore, during the preparation of the printed texts, the two editors apparently became aware that a rival edition was about to be published. This situation resulted in a competitive endeavor to be the first in the field. When the two editions did appear, the title page in each instance made the claim that the autobiography had never before been published. The two texts must have been going through the press at approximately the same time, but which was in fact the first? In an article printed in 1950 Mr. Lodwick Hartley observes, "The complex bibliographical problems involved here have never been clarified."[12] The problem is indeed complex, but I believe I have been able to solve the major difficulties.

Let us begin with a brief examination of the two 1816 volumes. One edition was published by R. Edwards, London, under the title *Memoir of the Early Life of William Cowper, Esq., written by himself and never before published*. This is a small, 16 mo. edition containing sixteen pages of prefatory material and eighty-three pages of text. The publisher, Richard Edwards of 6 Crane Court, Fleet Street, was an obscure individual, who is listed in the *Post Office London Directory* simply as a printer. Very likely he issued the *Memoir* at the direction of the anonymous editor and had no more than a commercial interest in it.

The other edition was published by E. Cox & Son, London, under the title, *Memoirs of the Most Remarkable and Interesting Parts of the Life of William Cowper, Esq. of the Inner Temple, detailing particularly the Exercises of his Mind in Regard to Religion. Written by Himself and never before Published*. This volume, a 24 mo. text, is even smaller than the Edwards text. The publisher, Elizabeth Cox of St. Thomas's Street, is listed in the *Post Office London Directory* as a "medical bookseller." Although almost as obscure a person as Edwards, she was at least a publisher on a small scale, who employed the firm of Bentley to print the *Memoir*. This printing house was later to gain an excellent reputation, but in 1816 the Bentleys were not well known, and they probably had no special connection with the editor or publisher of the *Memoir*. In addition to medical books, Elizabeth Cox published various religious works, at least three of which were edited by the Reverend James Churchill. This fact is interesting chiefly because the Cox edition of Cowper's *Memoir* is dedicated to "James Churchill of Ditton, Surrey, as a small tribute to Unvarying Friendship and Exemplary Piety by his affectionate friends the Publishers." Churchill was an Evangelical clergyman whose life is briefly recorded in the *Evangelical Magazine* for 1849.[13] The article, curiously, does not mention the denomination to which he belonged, but both he and Elizabeth Cox were probably Baptists, for several of her religious publications bore the stamp of that sect. If they were Baptists, then it is at least possible that a manuscript of Cowper's *Memoir* had descended to them from the recently deceased William Bull, an Independent clergyman who had been a close friend of Cowper.

Both texts of the *Memoir* were introduced by prefaces phrased in the canting terms of the second generation Evangelicals. Each editor, in an effort to establish his edition as an early one, adopted the somewhat unusual practice of appending a specific date to his preface. In the Cox edition the date is July 3, 1816; in Edwards it is July 4, 1816. If one could trust this evidence, it would seem that the Cox version must have appeared just one day before the other. But are the dates supplied by the competing editors accurate? Evidence gleaned from other sources shows that one of them is not reliable.

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[8] *Works of William Cowper*, ed. T. S. Grimshawe, 5: 261, London, 1835.

[9] Bernard Martin, *John Newton*, 233, London, Heinemann, 1950.

[10] Grimshawe, 262, n.

[11] *Memoirs . . . of William Cowper*, Preface, London, E. Cox & Son, 1816.

[12] Cowper and the Evangelicals, *Pub. Mod. Lang. Assn.* 65: 728, n. 29, 1950.

[13] 27: 589–592, 1849.

The dates of publication can best be determined from the notices of new books that appeared in the *Times* and the *Morning Chronicle,* the two leading London newspapers. In the *Times* the first reference to either work is an announcement on August 30, 1816, of the publication "this day" of the Edwards text. This item is repeated in the *Times* of August 31. The *Times* first mentions the Cox version on November 11, 1816, when an advertisement announces a *second* edition of this work. For some reason the *Times* makes no reference to a first edition of Cox, but —and this is the most significant piece of evidence —the *Morning Chronicle* does list it among "books published today" under the date of July 3, 1816. This date, it will be observed, is the same as that given in the preface of this edition. It seems clear, therefore, that the Cox text not only appeared first, but appeared almost two months earlier than the Edwards edition, despite the date of July 4 in the latter work. Substantiating evidence is found in the announcement of new books in the July issue of the *European Magazine.* Here the Cox edition is listed as a July publication, and no mention is made of the Edwards text.[14]

Who the editors were will probably remain a mystery. As we have remarked, both probably belonged to the Evangelical religious group, though they may have been of different denominations. Although each had been eager to be the first to publish, both editors felt somewhat embarrassed about producing a work never intended for publication and which might therefore offend Cowper's surviving relatives. It was for this reason, no doubt, that they chose to remain anonymous. Their concern is also evident in the apologies which each makes in his preface. The Edwards edition states that the *Memoir* is being printed in order to prove that Cowper's insanity developed quite independently of his religious views and that it was not, as certain biographers had asserted, the result of religious melancholy. The editor of the Cox edition, after offering virtually the same excuse for printing, adds that he still would never "have dared to send these *Memoirs* into the world had he not been impelled to by recent information that they were about to be published at an expense that would render them inaccessible to the major part of those to whom they could be of any essential service." This was obviously an allusion to the Edwards edition which sold for four shillings. According to the *Morning Chronicle,* the Cox edition cost three shillings.[15]

In addition to the text and preface the Edwards volume included several letters of Cowper, a review of William Hayley's life of the poet, and a sermon on the sin of suicide. This last item was apparently inserted in order to dissuade readers from imitating Cowper's attempts to take his life. The Cox edition printed an appendix containing the poet's "Lines Written Under the Influence of Delirium" and the fragment of another poem.

The *Memoir* made its appearance at a time when the reading public took an extremely censorious view of anything scandalous. Although there was nothing really scandalous in Cowper's autobiographical sketch, the candid account of his attempts at suicide and the details of his insanity evidently shocked many persons. Several periodicals chose to pass over the publication in discreet silence. Others raised strong objections. The *Quarterly Review* and the *Annual Register,* for instance, asserted that the printing of the *Memoir* was an impropriety which could only injure Cowper's considerable reputation.[16] Ironically the Evangelicals, who generally formed the most censorious group, were more or less forced either to ignore the publication or to defend it. The reviewer for the *Evangelical Magazine,* though recognizing that Cowper had never allowed the *Memoir* to be printed in his lifetime, maintained that it was impossible to suppress a work that existed in several manuscript copies. He added that since publication was inevitable, it could probably not appear in a less objectionable form than that of the Edwards edition.[17]

One suspects that the Evangelicals were pleased to have another narrative of a conversion to add to their now formidable list, especially since the author in this instance was a famous poet who would be read by many not otherwise inclined to peruse the works of an Evangelical writer. Circulated in a small volume, more or less in the form of a tract, the *Memoir* appeared in at least seven editions in England before its inclusion in Grimshawe's collected edition of Cowper's works. In America it was printed at Philadelphia, Boston, and at Newburgh, New York.

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[14] 70: 87, July, 1816.

[15] July 3, 1816.

[16] *Quarterly Review* 16: 123, Oct., 1816; *New Annual Register for the Year 1816,* 281.

[17] 25: 142–143, April, 1817.

It is possible that manuscript copies may still exist, though I have been unable to locate any. The present text is that of the Edwards edition, the one most frequently reprinted in the nineteenth century. The Cox edition includes a few references that do not appear in Edwards. These have been supplied in footnotes. Other differences are chiefly of a stylistic nature. For instance where Edwards has "the morning was clear and calm," Cox has "the morning was mild and serene." Where Edwards prints "the only thing that could promote and effectuate my cure was yet wanting—an experimental knowledge of the redemption which is in Christ Jesus," Cox substitutes "truth" for "redemption." Although the announcement in the *Morning Chronicle* states that the Cox text is based on the original autograph manuscript, nothing in the printed version indicates that it is more authentically Cowper than the Edwards text. In fact, the latter is sometimes superior stylistically to the Cox edition. In publishing the first edition of the *Memoir* to appear in over a hundred years, I have modernized punctuation and, in a few instances, altered capitalization and spelling.

For financial aid in preparing this work I am indebted to the Penrose Fund of the American Philosophical Society.

MEMOIR
of
THE EARLY LIFE
of
WILLIAM COWPER, Esq.

Written By Himself
And never before published.

With
AN APPENDIX
Containing
Some Of Cowper's Religious Letters
And other interesting Documents illustrative
of the Memoir.

London:
Printed For R. Edwards, Crane Court,
Fleet Street;
And Sold By All Booksellers.

1816

I cannot recollect that till the month of December in the thirty-second year of my life I had ever any serious impressions of the religious kind or at all bethought myself of the things of my salvation, except in two or three instances. The first was of so transitory a nature and passed when I was so very young that, did I not intend what follows for a history of my heart so far as religion has been its object, I should hardly mention it.

At six years old I was taken from the nursery and from the immediate care of a most indulgent mother and sent to a considerable school in Bedfordshire.[1] Here I had hardships of different kinds to conflict with, which I felt more sensibly in proportion to the tenderness with which I had been treated at home. But my chief affliction consisted in my being singled out from all the other boys by a lad about fifteen years of age as a proper object upon whom he might let loose the cruelty of his temper. I choose to forbear a particular recital of the many acts of barbarity with which he made it his business continually to persecute me; it will be sufficient to say that he had by his savage treatment of me impressed such a dread of his figure upon my mind that I well remember being afraid to lift up my eyes upon him higher than his knees, and that I knew him by his shoe-buckles better than any other part of his dress. May the Lord pardon him and may we meet in glory!

One day as I was sitting alone on a bench in the school, melancholy and almost ready to weep at the recollection of what I had already suffered and expecting at the same time my tormentor every moment, these words of the Psalmist came into my mind, "I will not be afraid of what man can do unto me." I applied this to my own case with a degree of trust and confidence in God that would have been no disgrace to a much more experienced Christian. Instantly I perceived in myself a briskness of spirits and a cheerfulness which I had never before experienced, and took several paces up and down the room with joyful alacrity—*his gift* in whom I trusted. Happy had it been for me if this early effort towards a dependence on the blessed God had been frequently repeated by me. But alas! it was the first and last instance of the kind between infancy and manhood. The cruelty of this boy, which he had long practised in so secret a manner that no creature suspected it, was at length discovered. He was expelled from the school and I was taken from it.

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[1] Dr. Pitman's School at Market Street, on the border of Bedfordshire and Hertfordshire.

From hence at eight years old I was sent to Mr. D,[2] an eminent surgeon and oculist, having very weak eyes and being in danger of losing one of them. I continued a year in this family, where religion was neither known nor practised, and from thence was dispatched to Westminster. Whatever seeds of religion I might carry thither before my seven years' apprenticeship to the classics was expired, they were all marred and corrupted; the duty of the school-boy swallowed up every other; and I acquired Latin and Greek at the expense of a knowledge much more important.

Here occurred the second instance of serious consideration. As I was crossing St. Margaret's Church-yard late one evening, I saw a glimmering light in the midst of it which excited my curiosity. Just as I arrived at the spot a grave-digger who was at work by the light of his lanthorn threw up a skull which struck me upon the leg. This little accident was an alarm to my conscience, for that event may be numbered among the best religious documents which I received at Westminster. The impression, however, presently went off and I became so forgetful of mortality that, strange as it may seem, surveying my activity and strength and observing the evenness of my pulse, I began to entertain with no small complacency a notion that perhaps I might never die! This notion was, however, very short-lived, for I was soon after struck with a lowness of spirits uncommon at my age and frequently had intimations of a consumptive habit. I had skill enough to understand their meaning but could never prevail on myself to disclose them to anyone, for I thought any bodily infirmity a disgrace, especially a consumption. This messenger from the Lord, however, did his errand and perfectly convinced me that I was mortal.

That I may do justice to the place of my education I must relate one mark of religious discipline which in my time was observed at Westminster; I mean the pains which Dr. Nicholls[3] took to prepare us for confirmation. The old man acquitted himself of this duty like one who had a deep sense of its importance; and I believe most of us were struck by his manner and affected by his exhortation. For my own part I then for the first time attempted prayer in secret; but being little accustomed to that exercise of the heart and having very childish notions of religion, I found it a difficult and painful task and was even then frightened at my own insensibility. This difficulty, though it did not subdue my good purposes till the ceremony of confirmation was past, soon after entirely conquered them; I relapsed into a total forgetfulness of God with the usual disadvantage of being more hardened for having been softened to no purpose.

At twelve or thirteen I was seized with the small-pox. I only mention this to show that at that early age my heart was become proof against the ordinary means which a gracious God employs for our chastisement. Though I was severely handled by the disease and in imminent danger, yet neither in the course of it nor during my recovery had I any sentiment of contrition, any thought of God or eternity. On the contrary, I was scarcely raised from the bed of pain and sickness before the emotions of sin became more violent in me than ever, and the devil seemed rather to have gained than lost an advantage, so readily did I admit his suggestions and so passive was I under them.

By this time I became such an adept in the infernal art of lying that I was seldom guilty of a fault for which I could not at a very short notice invent an apology capable of deceiving the wisest. These I know are called school-boys' tricks, but a total depravity of principle and the work of the father of lies are universally at the bottom of them.

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[2] Mr. Disney. He and his wife were both oculists. Wright, *op. cit.*, 122–123.

[3] John Nicoll, who became headmaster of Westminster in 1733 and served in that position for twenty years. John Sargeaunt, *Annals of Westminster School*, 165, London, 1898.

At the age of eighteen, being tolerably furnished with grammatical knowledge but as ignorant in all points of religion as the satchel at my back, I was taken from Westminster and, having spent about nine months at home, was sent to acquire the practice of the law with an attorney.[4] There I might have lived and died without hearing or seeing anything that might remind me of a single Christian duty, had it not been that I was at liberty to spend my leisure time (which was well nigh all my time) at my uncle's in Southampton Row.[5] By this means I had indeed an opportunity of seeing the inside of a church, whither I went with the family on Sundays, which probably I should otherwise never have seen.

At the expiration of this term I became in a manner complete master of myself and took possession of a complete set of chambers in the Temple[6] at the age of twenty-one. This being a critical season of my life and one upon which much depended, it pleased my all-merciful Father in Jesus Christ to give a check to my rash and ruinous career of wickedness at the very onset. I was struck not long after my settlement in the Temple with such a dejection of spirits as none but they who have felt the same can have the least conception of. Day and night I was upon the rack, lying down in horror and rising up in despair. I presently lost all relish for those studies to which I had before been closely attached; the classics no longer had any charms for me; I had need of something more salutary than amusement, but I had no one to direct me where to find it.

At length I met with Herbert's Poems, and gothic and uncouth as they were, I yet found in them a strain of piety which I could not but admire. This was the only author I had any delight in reading. I pored over him all day long, and though I found not here what I might have found, a cure for my malady, yet it never seemed so much alleviated as while I was reading him. At length I was advised by a very near and dear relative to lay him aside, for he thought such an author more likely to nourish my disorder than to remove it.

In this state of mind I continued near a twelvemonth when, having experienced the inefficacy of all human means, I at length betook myself to God in prayer; such is the rank which our Redeemer holds in our esteem—never resorted to but in the last instance when all creatures have failed to succour us. My hard heart was at length softened and my stubborn knees brought to bow. I composed a set of prayers and made frequent use of them. Weak as my faith was, the Almighty who will not break the bruised reed nor quench the smoking flax was graciously pleased to hear me.

A change of scene was recommended to me, and I embraced an opportunity of going with some friends[7] to Southampton, where I spent several months. Soon after our arrival we walked to a place called Freemantle about a mile from the town; the morning was clear and calm; the sun shone bright upon the sea; and the country on the borders of it was the most beautiful I had ever seen. We sat down upon an eminence at the end of the arm of the sea which runs between Southampton and the New Forest. Here it was that on a sudden, as if another sun had been kindled that instant in the heavens on purpose to dispel sorrow and vexation of spirit, I felt the weight of all my misery taken off; my heart became light and joyful in a moment; I could have wept with transport had I been alone. I must needs believe that nothing less than the Almighty fiat could have filled me with such inexpressible delight, not by a gradual dawning of peace, but, as it were, with a flash of his life-giving countenance. I think I remember something like a glow of gratitude to the Father of mercies for this unexpected blessing and that I ascribed it to his gracious acceptance of my prayers. But Satan and my own wicked heart quickly persuaded me that I was indebted for my deliverance to nothing but a change of scene and the amusing varieties of the place.[8] By this means he turned the blessing into a poison, teaching me to conclude that nothing but a continued circle of diversion and indulgence of appetite could secure me from a relapse.

Upon this hellish principle, as soon as I returned to London, I burnt my prayers and away went all thoughts of devotion and dependence upon God my Saviour. Surely it was of his mercy that I was not consumed; glory be to his grace! Two deliverances from danger not making any impression—having spent about twelve years in the Temple in an uninterrupted course of sinful indulgence and my associates and companions being either like myself professed Christians or professed Infidels—I obtained at length so complete a victory over my conscience that all remonstrances from that quarter were in vain and in a manner silenced, though sometimes indeed a question would arise in my mind whether it were safe to proceed any farther in a course so plainly and utterly condemned in the word of God. I saw clearly that if the gospel were true such a conduct must inevitably end in my destruction, but I saw not by what means I could change my Ethiopian complexion or overcome such an inveterate habit of rebelling against God.

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[4] Mr. Chapman of Ely Place, Holborn. Cowper was articled to him for three years and resided with him during that time. Edward Thurlow, future Lord Chancellor, was Cowper's fellow-student.

[5] Ashley Cowper, a younger brother of the poet's father. His three daughters, Harriet, Theodora, and Elizabeth, were about Cowper's age.

[6] Cowper took chambers in the Middle Temple in 1752. In 1759 he moved to the Inner Temple, where he purchased an apartment for £250.

[7] Among the friends were his cousin Harriet and her future husband, Sir Thomas Hesketh.

[8] This was the occasion Cowper referred to when he developed the belief that he had had committed the unpardonable sin.

The next thing that occurred to me was a doubt whether the gospel were true or false. To this succeeded many an anxious wish for the decision of this important question, for I foolishly thought that obedience would presently follow were I but convinced that it was worth while to attempt it. Having no reason to expect a miracle and not hoping to be satisfied with anything less, I acquiesced at length in the force of that devilish conclusion that the only course I could take to secure my present peace was to wink hard against the prospect of future misery and to resolve to banish all thoughts of a subject upon which I thought to so little purpose. Nevertheless, when I was in the company of Deists and heard the gospel blasphemed, I never failed to assert the truth of it with much vehemence of disputation, for which I was the better qualified having been always an industrious and diligent inquirer into the evidences by which it was externally supported. I think I once went so far into a controversy of this kind as to assert that I would glady submit to have my right hand cut off, so that I might but be enabled to live according to the gospel. Thus have I been employed when half intoxicated in vindicating the truth of scripture while in the very act of rebellion against its dictates. Lamentable inconsistency of a convinced judgment with an unsanctified heart! An inconsistency indeed evident to others as well as to myself, inasmuch as a deistical friend of mine with whom I was disputing upon the subject cut short the matter by alleging that if what I said were true I was certainly damned by my own showing.

By this time, my patrimony being well nigh spent and there being no appearance that I should ever repair the damage by a fortune of my own getting, I began to be a little apprehensive of approaching want. It was, I imagine, under some apprehensions of this kind that I one day said to a friend of mine, if the clerk to the journals of the House of Lords should die I had some hopes that my kinsman[9] who had the place in his disposal would appoint me to succeed him. We both agreed that the business of that place, being transacted in private, would exactly suit me, and both expressed an earnest wish for his death that I might be provided for. Thus did I covet what God had commanded me not to covet and involved myself in still deeper guilt by doing it in the spirit of a murderer. It pleased the Lord to give me my heart's desire and with it an immediate punishment for my crime. The poor man died and by his death not only the clerkship of the journals became vacant but it became necessary to appoint officers to two other places jointly as deputies to Mr. De Grey, who at this time resigned. These were the office of reading clerk and the clerkship of the committees—of much greater value than that of the journals. The patentee of these appointments (whom I pray to God to bless for his benevolent intention to serve me) called on me at my chambers and having invited me to take a turn with him in the garden there made me an offer of the two most profitable places, intending the other for his friend Mr. A.[10] Dazzled by so splendid a proposal and not immediately reflecting upon my incapacity to execute a business of so public a nature, I at once accepted it, but at the same time (such was the will of Him whose hand was in the whole matter) seemed to receive a dagger in my heart. The wound was given and every moment added to the smart of it. All the considerations by which I endeavored to compose my mind to its former tranquillity did but torment me the more, proving miserable comforters and counsellors of no value. I returned to my chambers thoughtful and unhappy; my countenance fell; and my friend was astonished, instead of that additional cheerfulness he might so reasonably expect, to find an air of deep melancholy in all I said or did.

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[9] The poet's grandfather, Spencer Cowper, had purchased the grant of Clerk of the Parliaments in reversion for his sons. The holder of this lucrative office had the right of appointment to various other clerkships. The kinsman to whom Cowper refers was Major William Cowper, who exercised the rights of the office after the death of his father, William Cowper, in 1740, though Ashley Cowper, the only remaining son of Spencer Cowper in 1763, was nominally Clerk of the Parliaments. *Gentleman's Magazine* **10**: 92, Feb., 1740, and **58**: 564, June, 1788.

[10] A Mr. Arnold, according to the Cox edition of the *Memoir*.

Having been harassed in this manner by day and night for the space of a week, perplexed between the apparent folly of casting away the only visible chance I had of being well provided for and the impossibility of retaining it, I determined at length to write a letter to my friend, though he lodged in a manner at the next door and we generally spent the day together. I did so and therein begged him to accept my resignation and to appoint Mr. A. to the places he had given me, and permit me to succeed Mr. A. I was well aware of the disproportion between the value of his appointment and mine; but my peace was gone; pecuniary advantages were not equivalent to what I had lost; and I flattered myself that the clerkship of the journals would fall fairly and easily within the scope of my abilities. Like a man in a fever, I thought a change of posture would relieve my pain, and, as the event will show, was equally disappointed. At length I carried my point—my friend in this instance preferring the gratification of my desires to his own interest, for nothing could be so likely to bring a suspicion of bargain and sale upon his nomination, which the Lords would not have endured, as his appointment of so near a relative to the least profitable office while the most valuable was allotted to a stranger.

The matter being thus settled, something like a calm took place in my mind. I was indeed not a little concerned about my character, being aware that it must needs suffer by the strange appearance of my proceedings. This, however, being but a small part of the anxiety I had laboured under, was hardly felt when the rest was taken off. I thought my path to an easy maintenance was now plain and open and for a day or two was tolerably cheerful. But behold the storm was gathering all the while, and the fury of it was not the less violent for this gleam of sunshine.

In the beginning a strong opposition to my friend's right of nomination began to show itself. A powerful party was formed among the Lords to thwart it in favor of an old enemy of the family, though one much indebted to its bounty; and it appeared plain that if we succeeded at last it would only be by fighting our ground by inches. Every advantage I was told would be sought for and eagerly seized to disconcert us. I was bid to expect an examination at the bar of the House touching my sufficiency for the post I had taken. Being necessarily ignorant of the nature of that business, it became expedient that I should visit the office daily in order to qualify myself for the strictest scrutiny. All the horror of my fears and perplexities now returned. A thunderbolt would have been as welcome to me as this intelligence. I knew to demonstration that upon these terms the clerkship of the journals was no place for me. To require my attendance at the bar of the House that I might there publicly entitle myself to the office was in effect to exclude me from it. In the meantime the interest of my friend, the honor of his choice, my own reputation and circumstances all urged me forward; all pressed me to undertake that which I saw to be impracticable. They whose spirits are formed like mine to whom a public examination of themselves on any occasion is mortal poison may have some idea of the horrors of my situation; others can have none.

My continual misery at length brought on a nervous fever: quiet forsook me by day and peace by night; a finger raised against me was more than I could stand against. In this posture of mind I attended regularly at the office, where, instead of a soul upon the rack, the most active spirits were essentially necessary for my purpose. I expected no assistance from anybody there, all the inferior clerks being under the influence of my opponent, and accordingly I received none. The journal books were indeed thrown open to me—a thing which could not be refused, and from which perhaps a man in health and with a head turned to business might have gained all the information he wanted—but it was not so with me. I read without perception and was so distressed that had every clerk in the office been my friend it could have availed me little, for I was not in a condition to receive instruction, much less to elicit it out of manuscripts without direction. Many months went over me thus employed—constant in the use of means, despairing as to the issue.

The feelings of a man when he arrives at the place of execution are probably much like mine every time I set my foot in the office, which was every day for more than half a year together.

At length, the vacation being pretty far advanced, I made shift to get into the country and repaired to Margate. There by the help of cheerful company, a new scene, and the intermission of my painful employment I presently began to recover my spirits, though even here for sometime after my arrival (notwithstanding perhaps that the preceding day had been spent agreeably and without any disturbing recollection of my circumstances) my first reflections when I awoke in the morning were horrible and full of wretchedness. I looked forward to the approaching winter and regretted the flight of every moment which brought it nearer like a man borne away by a rapid torrent into a stormy sea whence he sees no possibility of returning and where he knows he cannot subsist. At length, indeed, I acquired such a facility of turning away my thoughts from the ensuing crisis that for weeks together I hardly adverted to it at all, but the stress of the tempest was yet to come and was not to be avoided by any resolution of mine to look another way.

"How wonderful are the works of the Lord and his ways past finding out!" Thus was he preparing me for an event which I least of all expected—even the reception of his blessed gospel working by means which in all human contemplation must needs seem directly opposite to that purpose but which in his wise and gracious disposal have, I trust, effectually accomplished it.

About the beginning of October, 1763, I was again required to attend the office and prepare for the push. This no sooner took place than all my misery returned; again I visited the scene of ineffectual labours; again I felt myself pressed by necessity on either side with nothing but despair in prospect. To this dilemma was I reduced: either to keep possession of the office to the last extremity and by so doing expose myself to a public rejection for insufficiency (for the little knowledge I had acquired would have quite forsaken me at the bar of the House); or else to fling it up at once and, by this means, run the hazard of ruining my benefactor's right of appointment by bringing his discretion into question. In this situation such a fit of passion has sometimes seized me when alone in my chambers that I have cried out aloud and cursed the hour of my birth, lifting up my eyes to heaven at the same time not as a suppliant but in the hellish spirit of rancorous reproach and blasphemy against my Maker. A thought would sometimes come across my mind that my sins had perhaps brought this distress upon me, that the hand of divine vengeance was in it, but in the pride of my heart I presently acquitted myself and thereby implicitly charged God with injustice, saying, "What sins have I committeed to deserve this?"

I saw plainly that God alone could deliver me, but was firmly persuaded that he would not and therefore omitted to ask it. Indeed at *his* hands I would not, but as Saul sought to the witch, so did I to the physician Dr. Heberden[11] and was as diligent in the use of drugs as if they would have healed my wounded spirit or have made the rough places plain before me. I made indeed one effort of a devotional kind, for having found a prayer or two,[12] I said them a few nights but with so little expectation of prevailing that way that I soon laid aside the book and with it all thoughts of God and hopes of a remedy.

I now began to look upon madness as the only chance remaining. I had a strong kind of foreboding that so it would one day fare with me, and I wished for it earnestly and looked forward to it with impatient expectation. My chief fear was that my senses would not fail me in time enough to excuse my appearance at the bar of the House of Lords, which was the only purpose I wanted it to answer. Accordingly the day of decision drew near and I was still in my senses, though in my heart I had formed many wishes and by word of mouth expressed many expectations to the contrary.

Now came the grand temptation, the point to which all the while Satan had been driving me, the dark and hellish purpose of self-murder. I grew more sullen and reserved, fled from all society, even from my most intimate friends, and shut myself up in my chambers. The ruin of my fortune, the contempt of my relations and acquaintance, the prejudice I should do my patron were all urged on me with irresistible energy. Being reconciled to the apprehension of madness, I began to be reconciled to the apprehension of death. Though formerly in my happiest hours I had never been able to glance a single thought that way without shuddering at the idea of dissolution, I now wished for it and found myself but little shocked at the idea of procuring it myself. Perhaps, thought I, there is no God; or if there be, the scriptures may be false; if so then God has nowhere forbidden suicide. I considered life as my property and therefore at my own disposal.

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[11] William Heberden (1710–1801), an excellent classical scholar, friend of Samuel Johnson, and one of the most distinguished physicians of his time.

[12] At this point the Cox edition reads, . . . "prayer or two in that repository of self-righteousness and pharisaical lumber, *The Whole Duty of Man.*"

Men of great name, I observed, had destroyed themselves, and the world still retained the profoundest respect for their memories.

But above all I was persuaded to believe that if the act were ever so unlawful and even supposing Christianity to be true, my misery in hell itself would be more supportable. I well recollect, too, that when I was about eleven years of age my father desired me to read a vindication of self-murder[13] and give him my sentiments upon the question. I did so and argued against it. My father heard my reasons and was silent, neither approving or disapproving, from whence I inferred that he sided with the author against me, though all the time, I believe, the true motive for his conduct was that he wanted, if he could, to think favorably of the state of a departed friend who had some years before destroyed himself and whose death had struck him with the deepest affliction. But this solution of the matter never once occurred to me, and the circumstance now weighed mightily with me.

At this time I fell into company at a chop-house with an elderly well-looking gentleman whom I had often seen there before but had never spoken to; he began the discourse and talked much of the miseries he had suffered. This opened my heart to him; I freely and readily took part in the conversation. At length self-murder became the topic, and in the result we agreed that the only reason why some men were content to drag on their sorrows with them to the grave and others were not was that the latter were endued with a certain indignant fortitude of spirit teaching them to despise life which the former wanted. Another person whom I met at a tavern told me that he had made up his mind about that matter and had no doubt about his liberty to die as he saw convenient, though, by the way, the same person, who has suffered many and great afflictions since, is still alive. Thus were the emissaries of the throne of darkness let loose upon me. Blessed be the Lord who has brought much good out of all this evil! This concurrence of sentiment in men of sense unknown to each other I considered as a satisfactory decision of the question and determined to proceed accordingly.

One evening in November, 1763, as soon as it was dark, affecting as cheerful and unconcerned an air as possible, I went into an apothecary's shop and asked for an half ounce phial of laudanum. The man seemed to observe me narrowly, but if he did I managed my voice and countenance so as to deceive him. The day that required my attendance at the bar of the House being not yet come and about a week distant, I kept my bottle close in my side-pocket, resolved to use it when I should be convinced there was no other way of escaping. This indeed seemed evident already, but I was willing to allow myself every possible chance of that sort and to protract the horrid execution of my purpose till the last moment, but Satan was impatient of delay.

The day before the period above mentioned arrived, being at Richard's coffee-house at breakfast, I read the newspaper and in it a letter which the further I perused it the more closely engaged my attention. I cannot now recollect the purport of it, but before I had finished it, it appeared demonstratively true to me that it was a libel or satire upon me. The author appeared to be acquainted with my purpose of self-destruction and to have written that letter on purpose to secure and hasten the execution of it. My mind probably at this time began to be disordered; however it was, I was certainly given up to a strong delusion. I said within myself, "your cruelty shall be gratified; you shall have your revenge," and flinging down the paper in a fit of strong passion I rushed hastily out of the room, directing my way towards the fields where I intended to find some house to die in, or, if not, determined to poison myself in a ditch when I should meet with one sufficiently retired.

Before I had walked a mile in the fields a thought struck me that I might yet spare my life—that I had nothing to do but to sell what I had in the funds (which might be done in an hour), go on board a ship, and transport myself to France. There, when every other way of maintenance should fail, I promised myself a comfortable asylum in some monastery, an acquisition easily made by changing my religion. Not a little pleased with this expedient, I returned to my chambers to pack up all that I could at so short a notice, but while I was looking over my portmanteau my mind changed again, and self-murder was recommended to me once more in all its advantages.

Not knowing where to poison myself, for I was liable to continual interruption in my chambers from my laundress and her husband, I laid aside that intention and resolved upon drowning. For that purpose I immediately took a coach and ordered the man to drive to Tower Wharf, intending to throw myself into the river from the Custom-house Quay. It would be strange should I omit to observe here how I was continually hurried away from such places as were most favorable to my design to others where it must be almost impossible to execute it—from the fields, where it was improbable that any thing should happen to prevent me, to the Custom-house Quay, where every thing of that kind was to be expected; and this by a sudden impulse which lasted just long enough to call me back again to my chambers and was immediately withdrawn. Nothing ever appeared more feasible than the project of going to France till it had served its purpose, and then in an instant it appeared impracticable and absurd even to a degree of ridicule.

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[13] The Cox edition reads, ". . . self-murder in the *Persian Letters,* I think by Mules Quince, and give. . . ." The editor, misreading the manuscript, has substituted "Mules Quince" for "Montesquieu." In No. 76 of the *Persian Letters* Usbek, the supposed writer of the letter, does defend suicide.

My life which I had called my own and claimed a right to dispose of was kept from me by him whose property indeed it was and who alone had a right to dispose of it. This is not the only occasion on which it is proper to make this remark; others will offer themselves in the course of this narrative so fairly that the reader cannot overlook them.

I left the coach upon the Tower Wharf, intending never to return to it, but upon coming to the Quay I found the water low and a porter seated upon some goods there, as if on purpose to prevent me. This passage to the bottomless pit being mercifully shut against me, I returned back to the coach and ordered it to return to the Temple. I drew up the shutters, once more had recourse to the laudanum, and determined to drink it off directly; but God had otherwise ordained. A conflict that shook me to pieces suddenly took place—not properly a trembling but a convulsive agitation which deprived me in a manner of the use of my limbs, and my mind was as much shaken as my body.

Distracted between the desire of death and the dread of it, twenty times I had the phial to my mouth and as often received an irresistible check; and even at the time it seemed to me that an invisible hand swayed the bottle downwards as often as I set it against my lips. I well remember that I took notice of this circumstance with some surprise, though it affected no change in my purpose. Panting for breath and in an horrible agony, I flung myself back into the corner of the coach. A few drops of laudanum which had touched my lips besides the fumes of it began to have a stupefying effect upon me. Regretting the loss of so fair an opportunity yet utterly unable to avail myself of it, I determined not to live; and already half dead with anguish I once more returned to the Temple. Instantly I repaired to my room and having shut both the outer and inner door prepared myself for the last scene of the tragedy. I poured the laudanum into a small basin, set it on a chair by the bedside, half undressed myself, and laid down between the blankets, shuddering with horror at what I was about to perpetrate. I reproached myself bitterly with folly and rank cowardice for having suffered the fear of death to influence me as it had done and was filled with disdain at my own pitiful timidity: but still something seemed to overrule me and to say *"Think what you are doing! Consider and live."*

At length, however, with the most confirmed resolution, I reached forth my hand towards the basin, when the fingers of both hands were as closely contracted as if bound with a cord and became entirely useless. Still, indeed, I could have made shift with both hands, dead and lifeless as they were, to have raised the basin to my mouth, for my arms were not at all affected: but this new difficulty struck me with wonder; it had the air of a divine interposition. I lay down in bed again to muse about it and while thus employed heard the key turn in the outer door and my laundress's husband came in. By this time the use of my fingers was restored to me: I started up hastily, dressed myself, hid the basin, and, affecting as composed an air as I could, walked out into the dining-room. In a few minutes I was left alone; and now unless God had evidently interposed for my preservation I should certainly have done execution upon myself, having a whole afternoon before me.

Both the man and his wife being gone, outward obstructions were no sooner removed than new ones arose within. The man had just shut the door behind him when the convincing Spirit came upon me and a total alteration in my sentiments took place. The horror of the crime was immediately exhibited to me in so strong a light that, being seized with a kind of furious indignation, I snatched up the basin, poured away the laudanum into a phial of foul water, and, not content with that, flung the phial out of the window. This impulse having served, the present purpose was withdrawn.

I spent the rest of the day in a kind of stupid insensibility, undetermined as to the manner of dying but still bent on self-murder as the only possible deliverance. That sense of the enormity of the crime which I had just experienced had entirely left me; and unless my Eternal Father in Christ Jesus had interposed to disannul my covenant with death and my agreement with hell that I might hereafter be admitted into the covenant of mercy, had by this time been a companion of devils and the just object of his boundless vengeance.

In the evening a most intimate friend called upon me and felicitated me on a happy resolution which he had heard I had taken to stand the brunt and keep the office. I knew not whence this intelligence arose but did not contradict it. We conversed awhile with a real cheerfulness on his part and an affected one on mine, and when he left me I said in my heart I shall see thee no more!

Behold into what extremities *a good sort of man* may fall! Such was I in the estimation of those who knew me best; a decent outside is all a good-natured world requires. Thus equipped, though all within be rank atheism, rottenness of heart, and rebellion against the blessed God, we are said to be good enough; and if *we* are damned, alas! who shall be saved! Reverse this charitable reflection and say, if *a good sort of man* be saved, who then shall perish? And it comes much nearer the truth, but this is a hard saying and the world cannot bear it.

I went to bed, as I thought, to take my last sleep in this world. The next morning was to place me at the bar of the House, and I determined not to see it. I slept as usual and awoke about three o'clock. Immediately I arose and by the help of a rushlight found my penknife, took it into bed with me, and lay with it for some hours directly pointed against my heart. Twice or thrice I placed it upright under my left breast, leaning all my weight upon it, but the point was broken off and would not penetrate.

In this manner the time passed till the day began to break. I heard the clock strike seven, and instantly it occurred to me there was no time to be lost; the Chambers would soon be opened and my friend would call upon me to take me with him to Westminster. "Now is the time," thought I, "this is the crisis, no more dallying with the love of life." I arose and, as I thought, bolted the inner door of my chambers but was mistaken; my touch deceived me and I left it as I found it. My preservation, indeed, as it will appear, did not depend upon that incident; but I mention it to show that the good providence of God watched over me to keep open every way of deliverance that nothing might be left to hazard.

Not one hesitating thought now remained, but I fell greedily to the execution of my purpose. My garter was made of a broad scarlet binding with a sliding buckle being sewn together at the ends; by the help of the buckle I made a noose and fixed it about my neck, straining it so tight that I hardly left a passage for my breath or for the blood to circulate; the tongue of the buckle held it fast. At each corner of the bed was placed a wreath of carved work fastened by an iron pin which passed up through the midst of it. The other part of the garter which made a loop I slipped over one of these and hung by it some seconds, drawing up my feet under me that they might not touch the floor; but the iron bent, the carved work slipped off, and the garter with it. I then fastened it to the frame of the tester, winding it round and typing it in a strong knot. The frame broke short and let me down again.

The third effort was more likely to succeed. I set the door open, which reached within a foot of the ceiling; by the help of a chair I could command the top of it, and the loop, being large enough to admit a large angle of the door, was easily fixed so as not to slip off again. I pushed away the chair with my feet and hung at my whole length. While I hung there I distinctly heard a voice say three times, "*'Tis over!*" Though I am sure of the fact and was so at the time, yet it did not at all alarm me or affect my resolution. I hung so long that I lost all sense, all consciousness of existence.

When I came to myself again I thought myself in hell; the sound of my own dreadful groans was all that I heard, and a feeling like that of flashes was just beginning to seize upon my whole body. In a few seconds I found myself fallen with my face to the floor. In about half a minute I recovered my feet and reeling and staggering I stumbled into bed again.

By the blessed providence of God the garter which had held me till the bitterness of temporal death was past broke just before eternal death had taken place upon me. The stagnation of the blood under one eye in a broad crimson spot and a red circle about my neck showed plainly that I had been on the brink of eternity. The latter, indeed, might have been occasioned by the pressure of the garter, but the former was certainly the effect of strangulation, for it was not attended with the sensation of a bruise, as it must have been had I in my fall received one in so tender a part. And I rather think the circle around my neck was owing to the same cause, for the part was not excoriated nor at all in pain.

Soon after I got into bed I was surprised to hear a noise in the dining-room, where the laundress was lighting a fire; she had found the door unbolted, notwithstanding my design to fasten it, and must have passed the bed-chamber door while I was hanging on it and yet never perceived me. She heard me fall and presently came to ask if I was well, adding she feared I had been in a fit.

I sent her to a friend to whom I related the whole affair and dispatched him to my kinsman at the coffee-house. As soon as the latter arrived I pointed to the broken garter, which lay in the middle of the room, and apprised him also of the attempt I had been making. His words were, "My dear Mr. Cowper, you terrify me; to be sure you cannot hold the office at this rate—where is the deputation?" I gave him the key of the drawers where it was deposited; and his business requiring his immediate attendance he took it away with him; and thus ended all my connexion with the Parliament House.

To this moment I had felt no concern of a spiritual kind. Ignorant of original sin, insensible of the guilt of actual transgression, I understood neither the law nor the gospel—the condemning nature of the one nor the restoring mercies of the other. I was as much unacquainted with Christ in all his saving offices as if his blessed name had never reached me. Now, therefore, a new scene opened upon me. Conviction of sin took place, especially of that just committed; the meanness of it as well as its atrocity were exhibited to me in colours so inconceivably strong that I despised myself with a contempt not to be imagined or expressed for having attempted it. This sense of it secured me from the repetition of a crime which I could not now reflect on without abhorrence.

Before I arose from bed it was suggested to me that there was nothing wanted but murder to fill up the measure of my iniquities, and that though I had failed in my design yet I had all the guilt of that crime to answer for. A sense of God's wrath and a deep despair of escaping it instantly succeeded. The fear of death became much more prevalent in me than ever the desire of it had been.

A frequent flashing like that of fire before my eyes and an excessive pressure upon the brain made me apprehensive of an apoplexy—an event which I thought the more probable as an extravasation in that part seemed likely enough to happen in so violent a struggle.

By the advice of my dear friend and benefactor, who called upon me again at noon, I sent for a physician and told him the fact and the stroke I apprehended. He assured me there was no danger of it and advised me by all means to retire into the country.[14] Being made easy in that particular and not knowing where to better myself, I continued in my chambers, where the solitude of my situation left me at full liberty to attend to my spiritual state—a matter I had till this day never sufficiently thought of.

At this time I wrote to my brother[15] at Cambridge to inform him of the distress I had been in and the dreadful method I had taken to deliver myself from it, assuring him as I faithfully might that I had laid aside all such horrid intentions and was desirous to live as long as it would please the Almighty to permit me.

My sins were now set in an array against me, and I began to see and feel that I had lived without God in the world. As I walked to and fro in my chamber I said within myself, *"There never was so abandoned a wretch, so great a sinner."* All my worldly sorrows seemed as though they had never been; the terrors which succeeded them seemed so great and so much more afflicting. One moment I thought myself shut out from mercy by one chapter; the next by another. The sword of the Spirit seemed to guard the tree of life from my touch and to flame against me in every avenue by which I attempted to approach it. I particularly remember that the parable of the barren fig-tree was to me an inconceivable source of anguish; and I applied it to myself with a strong persuasion in my mind that when the Saviour pronounced a curse upon it he had me in his eye and pointed that curse directly at me.

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[14] Although Cowper does not this time mention the doctor by name, it probably was Heberden. Later Cowper referred to him as "virtuous and faithful Heberden" who

> Gives melancholy up to nature's care,
> And sends the patient into purer air.
> *Retirement*, 281–282.

[15] John Cowper (1737–1770), the poet's only brother was Fellow of Benet (Corpus Christi) College, Cambridge, and rector of Foxton.

I turned over all Archbishop Tillotson's sermons [16] in hopes to find one upon the subject and consulted my brother upon the true meaning of it, desirous if possible to obtain a different interpretation of the matter than my evil conscience would suffer me to fasten on it. "O Lord thou didst vex me with all thy storms, all thy billows went over me; thou didst run upon me like a giant in the night season, thou didst scare me with visions in the night season."

In every book I opened I found something that struck me to the heart. I remember taking up a volume of Beaumont and Fletcher which lay upon the table in my kinsman's lodgings and the first sentence which I saw was this, "The justice of the gods is in it." My heart instantly replied, "It is the truth," and I cannot but observe that as I found something in every author to condemn me so it was the first sentences in general I pitched upon. Everything preached to me, and everything preached the curse of the law.

I was now strongly tempted to use laudanum, not as a poison, but as an opiate to compose my spirits—to stupify my awakened and feeling mind, harassed with sleepless nights and days of uninterrupted misery. But God forbade it who would have nothing to interfere with the quickening work he had begun in me; and neither the want of rest nor continued agony of mind could bring me to the use of it. I hated and abhorred the very smell of it.

I never went into the street but I thought the people stood and laughed at me and held me in contempt, and could hardly persuade myself but that the voice of my conscience was loud enough for every one to hear it. They who knew me seemed to avoid me, and if they spoke to me seemed to do it in scorn. I bought a ballad of one who was singing it in the street because I thought it was written on me.

I dined alone either at the tavern, where I went in the dark, or at the chop-house, where I always took care to hide myself in the darkest corner of the room. I slept generally an hour in the evening, but it was only to be terrified in dreams, and when I awoke it was some time before I could walk steadily through the passage into the dining-room. I reeled and staggered like a drunken man; the eyes of man I could not bear; but when I thought that the eyes of God were upon me (which I felt assured of) it gave me the most intolerable anguish. If for a moment a book or a companion stole away my attention from myself. a flash from hell seemed to be thrown into my mind immediately, and I said within myself. "What are these things to me who am damned?" In a word I saw myself a sinner altogether and every way a sinner, but I saw not yet a glimpse of the mercy of God in Jesus Christ.

The capital engine in all the artillery of Satan had not yet been employed against me; already overwhelmed with despair, I was not yet sunk into the bottom of the gulph. This was a fit season for the use of it, and accordingly I was set to inquire whether I had not been guilty of the unpardonable sin, and was presently persuaded that I had.

A neglect to improve the mercies of God at Southampton on the occasion above mentioned was represented to me as the sin against the Holy Ghost. No favourable construction of my conduct in that instance, no argument of my brother's who was now with me, nothing he could suggest in extenuation of my offences could gain a moment's admission. Satan furnished me so readily with weapons against myself that neither scripture nor reason could undeceive me. Life appeared to me now more eligible than death only because it was a barrier between me and everlasting burnings.

My thoughts in the day became still more gloomy, and my night visions more dreadful. One morning as I lay between sleeping and waking I seemed to myself to be walking in Westminster Abbey, waiting till prayers should begin; presently I thought I heard the minister's voice and hastened towards the choir; just as I was upon the point of entering, the iron gate under the organ was flung in my face with a jar that made the Abbey ring. The noise awoke me, and a sentence of excommunication from all the churches upon earth could not have been so dreadful to me as the interpretation which I could not avoid putting upon this dream.

Another time I seemed to pronounce to myself, "Evil be thou my good." I verily thought that I had adopted that hellish sentiment—it seemed to come so directly from my heart. I rose from bed to look for my prayer-book and having found it endeavoured to pray, but immediately experienced the impossibility of drawing nigh to God unless he first draw nigh to us. I made many passionate attempts towards prayer but failed in all.

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[16] The belief that he had committed the unpardonable sin may have been suggested to Cowper's distraught mind by reading in Archbishop Tillotson's *Works* a sermon entitled, "Of the Sin Against the Holy Ghost."

Having an obscure notion about the efficacy of faith, I resolved upon an experiment to prove whether I had faith or not. For this purpose I resolved to repeat the Creed; when I came to the second period of it, all traces of the former were struck out of my memory nor could I recollect one syllable of the matter. While I endeavored to recover it and when just upon the point, I perceived a sensation in my brain like a tremulous vibration in all the fibres of it. By this means I lost the words in the very instant when I thought to have laid hold of them. This threw me into an agony, but growing a little calmer I made an attempt for the third time; here again I failed in the same manner as before.

I considered it as a supernatural interposition to inform me that, having sinned against the Holy Ghost, I had no longer any interest in Christ or in the gifts of the Spirit. Being assured of this with the most rooted conviction, I gave myself up to despair. I felt a sense of burning in my heart like that of real fire and concluded it was an earnest of those eternal flames which would soon receive me. I laid myself down, howling with horror while my knees smote against each other.

In this condition my brother found me, and the first words I spoke to him were, "Oh! Brother, I am damned! think of eternity and then think what it is to be damned!" I had indeed a sense of eternity impressed upon my mind which seemed almost to amount to a full comprehension of it.

My brother, pierced to the heart with the sight of my misery, tried to comfort me, but all to no purpose. I refused comfort, and my mind appeared to me in such colours that to administer it to me was only to exasperate me and to mock my fears.

At length I remembered my friend Martin Madan[17] and sent for him. I used to think him an enthusiast but now seemed convinced that if there was any balm in Gilhead he must administer it to me. On former occasions when my spiritual concerns had at any time occurred to me I thought likewise on the necessity of repentance. I knew that many persons had spoken of shedding tears for sin, but when I asked myself whether the time would ever come when I should weep for mine, it seemed to me that a stone might sooner do it.

Not knowing that Christ was exalted to give repentance, I despaired of ever attaining to it. My friend came to me; we sat on the bedside together and he began to declare to me the gospel. He spoke of original sin and the corruption of every man born into the world, whereby every one is a child of wrath. I perceived something like hope dawning in my heart. This doctrine set me more on a level with the rest of mankind and made my condition appear less desperate.

Next he insisted on the all-atoning efficacy of the blood of Jesus and his righteousness for our justification. While I heard this part of his discourse and the scriptures on which he founded it, my heart began to burn within me; my soul was pierced with a sense of my bitter ingratitude to so merciful a Saviour; and those tears which I thought impossible burst forth freely. I saw clearly that my case required such a remedy and had not the least doubt within me but that this was the gospel of salvation.

Lastly he urged the necessity of a lively faith in Jesus Christ, not an assent only to the understanding, but a faith of application—an actual laying hold of it and embracing it as a salvation wrought out for me personally. Here I failed and deplored my want of such a faith. He told me it was the gift of God which he trusted he would bestow upon me. I could only reply, "I wish he would," a very irreverent petition, but a very sincere one and such as the Blessed God in his due time was pleased to answer.

My brother, finding that I had received consolation from Mr. Madan, was very anxious that I should take the earliest opportunity of conversing with him again and for this purpose pressed me to go to him immediately. I was for putting it off, but my brother seemed impatient of delay and at length prevailed on me to set out. I mention this to the honour of his candour and humanity, which would suffer no difference of sentiments to interfere with them.[18] My welfare was his only object, and all prejudices fled before his zeal to procure it. May he receive for his recompence all that happiness the gospel which I then first became acquainted with is alone able to impart!

Easier, indeed, I was, but far from easy. The wounded spirit within me was less in pain but by no means healed. What I had experienced was but the beginning of sorrows, and a long train of still greater terrors was at hand. I slept my three hours well and then awoke with ten times a stronger alienation from God than ever.

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[17] Martin Madan (1726–1790), son of Judith Cowper Madan, the poet's aunt. He abandoned a legal career and an early life of dissipation upon his conversion to Evangelicalism. Ordained in the Established Church, he became Chaplain of Lock Hospital, London.

[18] John Cowper was not an Evangelical at this time, and he probably had little sympathy for the religious revivalists.

Satan plied me closely with horrible visions and more horrible voices. My ears rang with the sound of torments that seemed to await me. Then did the pains of hell get hold on me, and before daybreak the very sorrows of death encompassed me. A numbness seized upon the extremities of my body, and life seemed to retreat before it; my hands and feet became cold and stiff; a cold sweat stood upon my forehead; my heart seemed at every pulse to beat its last and my soul to cling to my lips as if on the very brink of departure. No convicted criminal ever feared death more or was more assured of dying.

At eleven o'clock my brother called upon me, and in about an hour after his arrival that distemper of mind which I had so ardently wished for actually seized me.

While I traversed the apartment in the most horrible dismay of soul, expecting every moment that the earth would open her mouth and swallow me, my conscience scaring me, the avenger of blood pursuing me, and the city of refuge out of reach and out of sight, a strange and horrible darkness fell upon me. If it were possible that a heavy blow could light on the brain without touching the skull, such was the sensation I felt. I clapped my hand to my forehead and cried aloud through the pain it gave me. At every stroke my thoughts and expressions became more wild and incoherent; all that remained clear was the sense of sin and the expectation of punishment. These kept undisturbed possession all through my illness without interruption or abatement.

My brother instantly observed the change and consulted with my friends on the best manner to dispose of me. It was agreed among them that I should be carried to St. Albans, where Dr. Cotton[19] kept a house for the reception of such patients, and with whom I was known to have a slight acquaintance. Not only his skill as a physician recommended him to their choice but his well-known humanity and sweetness of temper. It will be proper to draw a veil over the secrets of my prison-house; let it suffice to say that the low state of body and mind to which I was reduced was perfectly well calculated to humble the natural vain-glory and pride of my heart.

These are the efficacious means which Infinite Wisdom thought meet to make use of for that purpose. A sense of self-loathing and abhorrence ran through all my insanity. Conviction of sin and expectation of instant judgment never left me from the 7th of December, 1763, until the middle of July following. The accuser of the brethren was ever busy with me night and day, bringing to my recollection in dreams the commission of long-forgotton sins and charging upon my conscience things of an indifferent nature as atrocious crimes.

All that passed in this long interval of eight months may be classed under two heads—conviction of sin and despair of mercy. But blessed be the God of my salvation for every sigh I drew, for every tear I shed, since thus it pleased him to judge me here that I might not be judged hereafter.

After five months of continual expectation that the divine vengeance would plunge me into the bottomless pit, I became so familiar with despair as to have contracted a sort of hardiness and indifference as to the event. I began to persuade myself that while the execution of the sentence was suspended it would be for my interest to indulge a less horrible train of ideas than I had been accustomed to muse upon. "Eat and drink for to-morrow thou shalt be in hell" was the maxim on which I proceeded. By this means I entered into conversation with the Doctor, laughed at his stories, and told him some of my own to match them—still, however, carrying a sentence of irrevocable doom in my heart.

He observed the seeming alteration with pleasure. Believing as well he might that my smiles were sincere, he thought my recovery well nigh completed, but they were in reality like the green surface of a morass—pleasant to the eye but a cover for nothing but rottenness and filth. The only thing that could promote and effectuate my cure was yet wanting—an experimental knowledge of the redemption which is in Christ Jesus.

I remember about this time a diabolical species of regret that found harbour in my wretched heart. I was sincerely sorry that I had not seized every opportunity of giving scope to my wicked appetites and even envied those who, being departed to their own place before me, had the consolation to reflect that they had well earned their miserable inheritance by indulging their sensuality without restraint. Oh merciful God! What a tophet of pollution is the human soul, and wherein do we differ from the devils, unless thy grace prevent us!

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[19] Nathaniel Cotton (1705–1788), a minor poet as well as a physician. Settling in St. Albans about 1740, he established an asylum which he called *"Collegium Insanorum."*

In about three months more (July 25, 1764) my brother came from Cambridge to visit me. Dr. C. having told him that he thought me greatly amended, he was rather disappointed at finding me almost as silent and reserved as ever, for the first sight of him struck me with many painful sensations both of sorrow for my own remediless condition and envy of his happiness.

As soon as we were left alone he asked me how I found myself; I answered, "As much better as despair can make me." We went together into the garden. Here on expressing a settled assurance of sudden judgment, he protested to me that it was all a delusion and protested so strongly that I could not help giving some attention to him. I burst into tears and cried out, "If it be a delusion then am I the happiest of beings." Something like a ray of hope was shot into my heart, but still I was afraid to indulge it. We dined together, and I spent the afternoon in a more cheerful manner. Something seemed to whisper to me every moment, "Still there is mercy."

Even after he left me this change of sentiment gathered ground continually; yet my mind was in such a fluctuating state that I can only call it a vague presage of better things at hand without being able to assign a reason for it. The servant observed a sudden alteration in me for the better, and the man whom I have ever since retained in my service expressed great joy on the occasion.

I went to bed and slept well. In the morning I dreamed that the sweetest boy I ever saw came dancing up to my bedside; he seemed just out of leading-strings, yet I took particular notice of the firmness and steadiness of his tread. The sight affected me with pleasure and served at least to harmonize my spirits, so that I awoke for the first time with a sensation of delight on my mind. Still, however, I knew not where to look for the establishment of the comfort I felt; my joy was as much a mystery to myself as to those about me. The blessed God was preparing me for the clearer light of his countenance by this first dawning of that light upon me.

Within a few days of my first arrival at St. Albans I had thrown aside the word of God as a book in which I had no longer any interest or portion. The only instance in which I can recollect reading a single chapter was about two months before my recovery. Having found a Bible on the bench in the garden, I opened upon the 11th of St. John, where Lazarus is raised from the dead, and saw so much benevolence, mercy, goodness, and sympathy with miserable man in our Saviour's conduct that I almost shed tears even after the relation, little thinking that it was an exact type of the mercy which Jesus was on the point of extending towards myself. I sighed and said, "Oh that I had not rejected so good a Redeemer that I had not forfeited all his favours!" Thus was my heart softened, though not yet enlightened. I closed the book without intending to open it again.

Having risen with somewhat of a more cheerful feeling, I repaired to my room, where breakfast waited for me. While I sat at table I found the cloud of horror which had so long hung over me was every moment passing away, and every moment came fraught with hope. I was continually more and more persuaded that I was not utterly doomed to destruction. The way of salvation was still, however, hid from my eyes; nor did I see it at all clearer than before my illness. I only thought that if it would please God to spare me I would lead a better life, and that I would yet escape hell if a religious observance of my duty would secure me from it.

Thus may the terror of the Lord make a Pharisee, but only the sweet voice of mercy in the gospel can make a Christian.

But the happy period which was to shake off my fetters and afford me a clear opening of the free mercy of God in Christ Jesus was now arrived. I flung myself into a chair near the window and, seeing a Bible there, ventured once more to apply to it for comfort and instruction. The first verse I saw was the 25th of the 3rd of Romans: "Whom God hath set forth to be a propitiation through faith in his blood to declare his righteousness for the remission of sins that are past through the forbearance of God."

Immediately I received strength to believe it, and the full beams of the Sun of Righteousness shone upon me. I saw the sufficiency of the atonement he had made, my pardon sealed in his blood, and all the fulness and completeness of his justification. In a moment I believed and received the gospel. Whatever my friend Madan had said to me long before revived in all its clearness, with demonstration of the Spirit and with power. Unless the Almighty arm had been under me, I think I should have died with gratitude and joy. My eyes filled with tears and my voice choked with transport, I could only look up to heaven in silent fear, overwhelmed with love and wonder. But the work of the Holy Ghost is best described in his own words. It is "joy unspeakable and full of glory." Thus was my heavenly Father in Christ Jesus pleased to give me the full assurance of faith and out of a strong, stony, unbelieving heart to raise up a child unto Abraham. How glad should I now have been to have spent every moment in prayer and thanksgiving!

I lost no opportunity of repairing to a throne of grace, but flew to it with an earnestness irresistible and never to be satisfied. Could I help it? Could I do otherwise than love and rejoice in my reconciled Father in Christ Jesus? The Lord had enlarged my heart, and I ran in the way of his commandments. For many succeeding weeks tears were ready to flow if I did but speak of the gospel or mention the name of Jesus. To rejoice day and night was all my employment. Too happy to sleep much, I thought it was but lost time that was spent in slumber. Oh that the ardour of my first love had continued! But I have known many a lifeless and unhallowed hour since—long intervals of darkness interrupted by short returns of peace and joy in believing.

My physician, ever watchful and apprehensive for my welfare, was now alarmed lest the sudden transition from respair to joy should terminate in a fatal frenzy. But "the Lord was my strength and my song and was become my salvation." I said, "I shall not die but live and declare the works of the Lord; he has chastened me sore but not given me over unto death. O give thanks unto the Lord for his mercy endureth for ever."

In a short time Dr. C. became satisfied and acquiesced in the soundness of my cure, and much sweet communion I had with him concerning the things of our salvation. He visited me every morning while I staid with him, which was near twelve months after my recovery, and the gospel was the delightful theme of our conversation.

No trial has befallen me since but what might be expected in a state of warfare. Satan, indeed, has changed his battery. Before my conversion sensual gratification was the weapon with which he sought to destroy me. Being naturally of an easy quiet, disposition, I was seldom tempted to anger; yet that passion it is which now gives me the most disturbance and occasions the sharpest conflicts. But Jesus being my strength I fight against it, and if I am not conqueror yet I am not overcome.

I now employed my brother to seek out an abode for me in the neighbourhood of Cambridge, being determined by the Lord's leave to see London, the scene of my former abominations, no more. I had still one place of preferment left which seemed to bind me under the necessity of returning thither again. But I resolved to break the bond, chiefly because my peace of conscience was in question. I held for some years the office of commissioner of bankrupts with about 60£ per annum. Conscious of my ignorance of the law, I could not take the accustomed oath and resigned it, thereby releasing myself from an occasion of great sin and every obligation to return to London. By this means I reduced myself to an income scarcely sufficient for my maintenance, but I would rather have starved in reality than deliberately offend against my Saviour, and his great mercy has since raised me up such friends as have enabled me to enjoy all the comforts and conveniences of life.[20] I am well assured that while I live "bread shall be given me and water shall be sure," according to his gracious promise.

After my brother had made many unsuccessful attempts to procure me a dwelling near him, I one day poured out my soul in prayer to God, beseeching him that wherever he should be pleased in his fatherly mercy to lead me it might be in the society of those who feared his name and loved the Lord Jesus Christ in sincerity—a prayer of which I have good reason to acknowledge his gracious acceptance.

In the beginning of June, 1765, I received a letter from my brother to say he had taken lodgings for me at Huntingdon which he believed would suit me. Though it was sixteen miles from Cambridge I was resolved to take them, for I had been two months in perfect health, and my circumstances required a less expensive way of life. It was with great reluctance, however, that I thought of leaving the place of my second nativity; I had so much leisure there to study the blessed word of God and had enjoyed so much happiness; but God ordered everything for me like an indulgent Father and had prepared a more comfortable place of residence than I could have chosen for myself.

On the 7th of June, 1765, having spent more than eighteen months at St. Albans, partly in bondage and partly in the liberty wherewith Christ had made me free, I took my leave of the place at four in the morning and set out for Cambridge.

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[20] Cowper had a small income from investments and the rental of his chambers in the Temple. His relatives on the Cowper side of the family contributed to his support after he left London.

The servant whom I lately mentioned as rejoicing in my recovery attended me.[21] He had maintained such an affectionate watchfulness over me during my whole illness and waited on me with so much patience and gentleness that I could not bear to leave him behind, though it was with some difficulty the Doctor was prevailed on to part with him. The strongest argument of all was the earnest desire he expressed to follow me. He seemed to have been providentially thrown in my way, having entered Dr. C.'s service just time enough to attend me; and I have a strong ground to hope that God will use me as an instrument to bring him to a knowledge of Jesus. It is impossible to say with how delightful a sense of his protection and fatherly care of me it has pleased the Almighty to favour me during the whole journey.

I remembered the pollution which is in the world and the sad share I had in it myself, and my heart ached at the thought of entering it again. The blessed God had endued me with some concern for his glory, and I was fearful of hearing it traduced by oaths and blasphemies—the common language of this highly favoured but ungrateful country. But "fear not, I am with thee" was my comfort. I passed the whole journey in silent communion with God, and those hours are amongst the happiest I have known.

I repaired to Huntingdon the Saturday after my arrival at Cambridge. My brother who had attended me thither had no sooner left me than, finding myself surrounded by strangers and in a strange place, my spirits began to sink and I felt (such was the backslidings of my heart) like a traveller in the midst of an inhospitable desert, without a friend to comfort or a guide to direct me. I walked forth towards the close of the day in this melancholy frame of mind, and having wandered about a mile from the town I found my heart at length so powerfully drawn towards the Lord that, having gained a retired and secret nook in the corner of a field, I kneeled down under a bank and poured forth my complaints before him. It pleased my Saviour to hear me in that this oppression was taken off, and I was enabled to trust in him that careth for the stranger, to roll my burden upon him, and to rest assured that wheresoever he might cast my lot the God of all consolation would still be with me. But this was not all. He did for me more than either I had asked or thought.

The next day I went to church for the first time after my recovery. Throughout the whole service I had much to do to restrain my emotions, so fully did I see the beauty and the glory of the Lord. My heart was full of love to all the congregation, especially to them in whom I observed an air of sober attention. A grave and sober person sat in the pew with me; him I have since seen and often conversed with, and have found him a pious man and a true servant of the blessed Redeemer. While he was singing the psalm I looked at him, and observing him intent on his holy employment I could not help saying in my heart with much emotion, "Bless you for praising him whom my soul loveth!"

Such was the goodness of the Lord to me that he gave me the oil of joy for mourning and the garment of praise for the spirit of heaviness; and though my voice was silent, being stopt by the intenseness of what I felt, yet my soul sung within me and even leapt for joy. And when the gospel for the day was read the sound of it was more than I could well support. Oh what a word is the word of God when the Spirit quickens us to receive it and gives the hearing ear and the understanding heart! The harmony of heaven is in it and discovers its author. The parable of the prodigal son was the portion. I saw myself in that glass so clearly, and the loving kindness of my slighted and forgotten Lord, that the whole scene was realized to me and acted over in my heart.

I went immediately after church to the place where I had prayed the day before and found the relief I had there received was but the earnest of a richer blessing. How shall I express what the Lord did for me except by saying that he made all his goodness to pass before me. I seemed to speak to him face to face, as a man conversing with his friend, except that my speech was only in tears of joy and groanings which cannot be uttered. I could say, indeed, with Jacob, not "how dreadful," but how lovely "is this place! There is none other than the house of God."

Four months I continued in my lodging. Some few of the neighbours came to see me but their visits were not very frequent, and in general I had but little intercourse except with my God in

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[21] Samuel Roberts. He remained Cowper's servant for over thirty years. Cowper also took from St. Albans a boy named Dick Coleman, the son of a drunken cobbler. He was eventually apprenticed to a breeches-maker. Thomas Wright, *Life of William Cowper*, 122–123, London, 1892.

Christ Jesus. It was he who made my solitude sweet and the wilderness to bloom and blossom as the rose, and my meditation of him was so delightful that if I had few other comforts neither did I want any.

One day, however, towards the expiration of this period I found myself in a state of desertion. That communion which I had so long been able to maintain with the Lord was suddenly interrupted. I began to dislike my solitary situation and to fear I should never be able to weather out the winter in so lonely a dwelling. Suddenly a thought struck me which I shall not fear to call a suggestion of the good providence which had brought me to Huntingdon. A few months before I had formed an acquaintance with the Rev. Mr. Unwin's family.[22] His son, though he had heard that I rather declined society than sought it, and though Mrs. Unwin [23] herself dissuaded him from visiting me on that account, was yet so strongly inclined to it that, notwithstanding all objections and arguments to the contrary, he one day engaged himself as we were coming out of church after morning prayers to drink tea with me that afternoon. To my inexpressible joy I found him one whose notions of religion were spiritual and lively—one whom the Lord had been training up from his infancy for the service of the temple. We opened our hearts to each other at the first interview, and when we parted I immediately retired to my chamber and prayed the Lord who had been the author to be the guardian of our friendship and to grant it fervency and perpetuity even unto death, and I doubt not that my gracious Father heard this prayer also.

The Sunday following I dined with him. That afternoon while the rest of the family was withdrawn I had much discourse with Mrs. Unwin. I am not at liberty to describe the pleasure I had in conversing with her because she will be one of the first who will have the perusal of this narrative. Let it suffice to say I found we had one faith and had been baptised with the same baptism.

When I returned home I gave thanks to God who had so graciously answered my prayers by bringing me into the society of Christians. She has since been a means in the hand of God of supporting, quickening, and strengthening me in my walk with him. It was long before I thought of any other connection with this family than as a friend and neighbour. On the day, however, above mentioned, while I was revolving in my mind the nature of my situation and beginning for the first time to find an irksomeness in such retirement, suddenly it occurred to me that I might probably find a place in Mr. Unwin's family as a boarder. A young gentleman who had lived with him as a pupil was the day before gone to Cambridge. It appeared to me at least possible that I might be allowed to succeed him. From the moment this thought struck me such a tumult of anxious solicitude seized me that for two or three days I could not divert my mind to any other subject. I blamed and condemned myself for want of submission to the Lord's will, but still the language of my mutinous and disobedient heart was, "Give me the blessing or else I die."

About the third evening after I had determined upon this measure I at length made shift to fasten my thoughts upon a theme which had no manner of connection with it. While I was pursuing my meditations—Mr. Unwin and family quite out of sight—my attention was suddenly called home again by the words which had been continually playing in my mind and were at length repeated with such importunity that I could not help regarding them:—"The Lord God of truth will do this." I was effectually convinced that they were not of my own production, and accordingly I received from them some assurance of success; but my unbelief and fearfulness robbed me of much of the comfort they were intended to convey, though I have since had many a blessed experience of the same kind for which I can never be sufficiently thankful. I immediately began to negotiate the affair and in a few days it was entirely concluded.

I took possession of my new abode Nov. 11, 1765. I have found it a place of rest prepared for me by God's own hand, where he has blessed me with a thousand mercies and instances of his fatherly protection, and where he has given me abundant means of furtherance in the knowledge of our Lord Jesus, both by the study of his own word and communion with his dear disciples. May nothing but death interrupt our union!

Peace be with the reader through faith in our Lord Jesus Christ. Amen!

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[22] The Unwin family consisted of the Reverend Morley Unwin; his wife, born Mary Cawthorne; a son William, a student at Cambridge and later ordained; and a daughter Susanna, who in 1774 married the Reverend Mathew Powley.

[23] Cox edition has "Mr. Unwin."

PALAEOLITHIC AND MESOLITHIC SITES IN SOVIET CENTRAL ASIA

HALLAM L. MOVIUS, JR.

Associate Professor and Curator of Palaeolithic Archaeology, Peabody Museum, Harvard University

SOVIET CENTRAL ASIA[2] consists of two clearly defined physiographic provinces: (*a*) the Turan Lowlands, a vast plains area characterized by shallow clayey basins that contain salt marshes and by dry, sandy or gravelly steppe; and (*b*) the western portion of the Central Asiatic Highlands, the structural core of the Asiatic continent, which extend into Afghanistan, India, and China to the south and east, and jut out onto the southern and eastern borders of the Turan Lowlands to the west (Cressey, 1951: 261, 263, 342–345). Starting with the Kirghiz Republic in the northeast there is the vast chain of the Tien-Shan Mountains, to the southwest of which lies the Fergana Basin in the upper valley of the Syr Darya (see fig. 1). Further to the south is the vast mountainous region of the Pamir-Alay system, which embraces the southeastern portion of Uzbekistan and the neighboring region of Tadjikistan. Indeed the mountains of Tadjikistan, which attain altitudes up to 7,493 meters (24,584 feet), are the highest in the U.S.S.R. Many ranges belong to the western portion of this system, the most important of which are: the Turkestan, the Zeravshan, the Gissar, the Peter-the-First, the Trans-Alay, the Darvaz, and others, as shown on the map, figure 1 (compare Berg, 1950: 167–170). To the south this mountain country is bounded by the Amu-Darya (Oxus River) Valley, which for a considerable distance serves as the frontier between the Soviet Union and Afghanistan.

In these extensive mountain systems traces of the former existence of extensive and severe glaciation is everywhere apparent (compare Flint, 1947: 61, and 364–365; von Klebelsberg, 1949: 413–414 and 791–800), but the Pleistocene geology of Central Asia has not yet been worked out in sufficient detail to permit the recognition of a multi-glacial sequence. Presumably a four-fold cycle ultimately will be found here just as in other parts of the world, but at present all one can say is that the ice appears to have advanced at least twice in these mountains. When the limits of the most recent glaciation, clearly recorded by a series of well preserved moraines, are compared with the present snowline, the magnitude of the Pleistocene ice-advances can be better appreciated. However, in comparison with the Alps and the Caucasus, where the depression of the snowline during the Fourth Glacial Stage was considerably more pronounced, one would expect that at least double the area of Central Asia would have been covered with ice during Würm times than is indicated by the contemporary moraines. That such was not the case is explained by various authorities (Gerasimov and Markov, 1939; Flint and Dorsey, 1945) as the result of the fact that the exceedingly dry continental climate of the region was not conducive to any considerable expansion and development of ice here during the glacial stages of the Pleistocene.

Previous to the late 1930's no indisputable traces of Palaeolithic or Mesolithic remains had ever been found in Soviet Central Asia. That this region was settled during Late Neolithic times—probably before the beginning of the 3rd millennium B.C.—is attested by such sites as Anau, which has close cultural connections with the Middle East (Pumpelly, 1908; Bartol'd, 1927; Bukinich, 1929; 1930; Kobranov, 1927; and Marushenko, 1939). The Palaeolithic and Mesolithic sites reported to date by Russian archaeologists working in Central Asia will be summarized in this paper; broadly they

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[1] This is the second of a series of studies on the Paleolithic cultures of the U.S.S.R. under preparation (compare Movius, 1953*a*; 1953*b*). At the outset the writer wishes to express his profound gratitude for generous grants from the American Academy of Arts and Sciences which have made this entire project possible. He also wants to thank Dr. Marc Raeff of Clark University, who abstracted many of the preliminary reports summarized in this paper, as well as Dr. Marija Gimbutas and Lawrence Krader for invaluable assistance in dealing with various materials presented in the Russian language. At all times Miss Margaret Currier and the staff of the Peabody Museum Library have helped in many ways, especially in obtaining on loan publications not available at Harvard, and the writer wishes to thank them for their assistance. Elsewhere (see footnote 4) acknowledgment is made to Chester S. Chard and Prof. T. D. McCown for making available an English translation of the report on the Russian excavations at the Cave of Teshik-Tash.

[2] As Cressey (1951: 338) points out, this term is somewhat of a misnomer since most of the area lies northwest of the Pamirs, but it follows current usage.

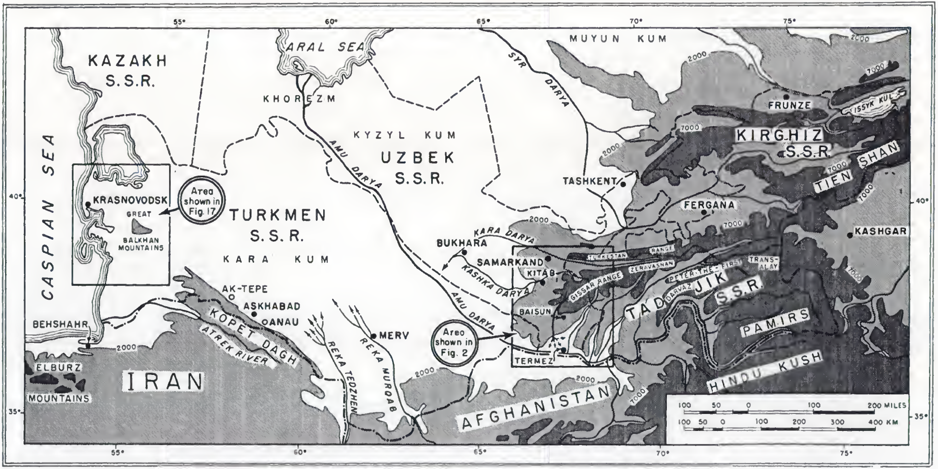
55°
60°
65°
70°
75°
40°
35°
KAZAKH S.S.R.
CASPIAN SEA
ARAL SEA
KHOREZM
KYZYL KUM
UZBEK S.S.R.
MUYUN KUM
SYR DARYA
AMU DARYA
TASHKENT
FERGANA
FRUNZE
ISSYK KUL
KIRGHIZ S.S.R.
TIEN SHAN
KASHGAR
Area shown in Fig. 17
KRASNOVODSK
GREAT BALKHAN MOUNTAINS
TURKMEN S.S.R.
KARA KUM
BUKHARA
KARA DARYA
SAMARKAND
KITAB
KASHKA DARYA
BAISUN
TERMEZ
TURKESTAN RANGE
ZERAVASNAN
GISSAR RANGE
PETER-THE-FIRST
TRANS-ALAY
DARVAZ
TADJIK S.S.R.
PAMIRS
HINDU KUSH
AK-TEPE
ASKHABAD
ANAU
KOPET DAGH
ATREK RIVER
BEHSHAHR
ELBURZ MOUNTAINS
IRAN
REKA TEDZHEN
REKA MURGAB
MERV
Area shown in Fig. 2
AFGHANISTAN
2000
7000
100 50 0 100 200 MILES
100 50 0 100 200 300 400 KM

FIG. 1. General map of Central Asia showing geographic features and areas covered by inset maps. (The contour lines express elevations in feet.)

may be grouped on a geographical basis, as follows: (*a*) the Baisun Region in Southeastern Uzbekistan; (*b*) the Samarkand Region; and (*c*) the Krasnovodsk Region in Western Turkmenia. In each case all the published materials to which we have access will be discussed, and those reports which we know to exist but have not been able to locate will be cited.

THE BAISUN REGION IN SOUTHEASTERN UZBEKISTAN

In the spring of 1938 the Palaeolithic and Neolithic Division of the Marr Institute for the History of Material Culture of the U.S.S.R. Academy of Sciences decided to send A. P. Okladnikov and V. D. Zaporozhskaia to participate in a systematic investigation of prehistoric sites in the Termez region of Uzbekistan (see fig. 1) and the mountainous tracts adjacent thereto. This project was under the general supervision of M. E. Masson, Leader of the Termez Archaeological Expedition (Masson, 1937; Voronets, 1937). The first season's excavations were conducted at the site of Old Termez, where flint artifacts and pot-sherds of Anau I type had been reported. Near Airatama, a small town east of Old Termez (see fig. 2), a second Stone Age locality was discovered. Following the termination of this work, the Expedition decided to conduct investigations in the mountain valley of the Shirabad-Darya, a river known as the Turgan-Darya in its upper reaches north of Derbent. This river, which flows through a precipitous gorge, drains the northeastern slopes of the Baisun-Tau, a chain of relatively low mountains that constitute a southwestern extension of the Gissar Range. Now the main body of the Gissar Range terminates near Mount Kodja-Pariarkh (14,514 feet), on whose northern slope is located the small Mus-Tovat glacier. But spurs of this range extend to the southwest in an arc-like fashion, the basic element of which is the Baisun-Tau. The axis of these Jurassic limestone foothills, and related ridge systems in this area, extend southward for more than 150 km. (94 miles) to the valley of the Amu-Darya, where they grade off into the half-desertic plain of Shirabad, one of the driest and hottest regions in the U.S.S.R. with July temperatures up to 122° F. (Cressey, 1951: 347). Formerly the Shirabad-Darya emptied into the Amu-Darya, but such is no longer the case since now the water is all taken for irrigation purposes on this plain.

It was in the Baisun-Tau, the average elevation of which is over 8,500 feet (2,600 meters), that an archaeological reconnaissance by G. V. Parfenov, Director of the Surkan-Dar'inskii District Museum in the city of Termez, during the years 1931–1934, had already indicated the existence of a series of caves and rock-shelters, some containing traces of prehistoric occupation (Parfenov, 1934). Originally it was Okladnikov's and Zaporozhskaia's intention to dig one of these cave sites, known as Katta-Kurgan, which is situated on the right bank of the Turgan-Darya between the twin villages of IUkary-Machai and Katta-Machai in the Baisunskii region of the Uzbekistan S.S.R. (see fig. 2 and p. 402). However, this plan was later abandoned, and an extensive search for new localities was undertaken. At a large number of caves test-pits revealed evidence of occupation only during historic times, but at six localities the existence of prehistoric cultural levels has been reported (Okladnikov, 1945). These are as follows: Zarangat-Gut, Dukan-Khan, Temir-Ul'de, Kurgan-Dar'ia, Amir-Temir and Teshik-Tash.[3] The latter site, which was finally selected, was completely excavated during the 1938 and 1939 seasons. A small-scale dig was also undertaken at Amir-Temir, a cave in the Baisun region not far from Teshik-Tash. The results of this work, which are summarized in this paper, demonstrate that this section of Southeastern Uzbekistan is extremely rich in cave and rock-shelter localities of different archaeological ages.

MOUSTERIAN SITES

Elsewhere the present writer has published a somewhat condensed English version of Okladnikov's report on his excavations at Teshik-Tash and other Mousterian sites in the Baisun region of Southeastern Uzbekistan (Movius, 1953*a*[4]).

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[3] Okladnikov (1949*a*: 9) also lists Katta-Sule-Kamar and Katta-Kamar as sites yielding evidence of Stone Age occupation, but no description of either of them has ever been published.

[4] In preparing this portion of the present paper the writer depended in very large measure on an outstandingly fine English translation of the entire Teshik-Tash report by Okladnikov, 1949 (the final Russian report on the Teshik-Tash project) supplemented by material presented by V. I. Gromova, 1949, and P. V. Suslova, 1949, and published by the Institute for Scientific Research in Anthropology in Moscow. The translation was most ably carried out by Chester S. Chard of Berkeley, California, at the instigation of Professor T. D. McCown, Chairman of the Department of Anthropology, University of California. At the outset, therefore, he wishes to record his indebtedness to both of these gentlemen for their kindness and generosity in placing a copy of this document at his disposal.

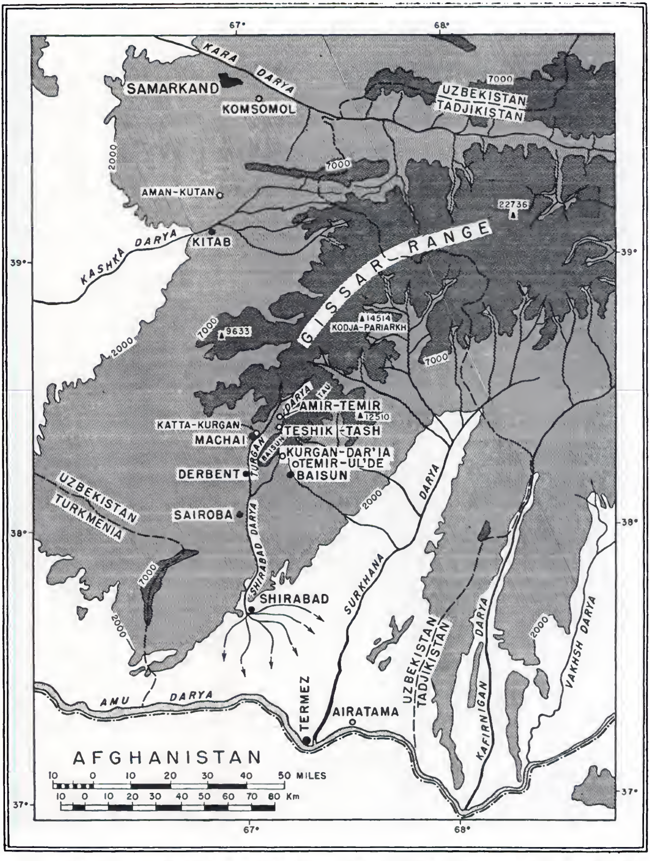
67°
68°
KARA DARYA
SAMARKAND
KOMSOMOL
UZBEKISTAN
TADJIKISTAN
7000
2000
AMAN-KUTAN
22736
KASHKA DARYA
KITAB
GISSAR RANGE
39°
14514
KODJA-PARIARKH
9633
AMIR-TEMIR
12510
KATTA-KURGAN
TESHIK-TASH
MACHAI
KURGAN-DAR'IA
TEMIR-UL'DE
DERBENT
BAISUN
SAIROBA
UZBEKISTAN
TURKMENIA
38°
SURKHANA DARYA
SHIRABAD DARYA
SHIRABAD
TERMEZ
AIRATAMA
AMU DARYA
KAFIRNIGAN DARYA
VAKHSH DARYA
AFGHANISTAN
10 0 10 20 30 40 50 MILES
10 0 10 20 30 40 50 60 70 80 Km
37°

FIG. 2. Southeastern Uzbekistan and adjacent areas showing locations of sites in the Baisun and Samarkand Regions. (The contour lines express elevations in feet.)

For this reason in the present paper only the essential data will be set forth in summary form.

Teshik-Tash, Baisun Region, Uzbekistan

This Mousterian cave site, excavated in 1938–1939 under the very able direction of A. P. Okladnikov, is the first Palaeolithic locality to be scientifically investigated in Central Asia.[5] Certainly it is by far the most important. As shown on the map (fig. 2), it lies 18 km. (11¼ miles) north of Baisun, a town approximately 144 km. (90 miles) due south of Samarkand, at an elevation of some 1,500 m. (5,000 ft.) above sea level and more than 400 m. (1,300 ft.) above the Turgan-Darya, near Machai. This altitude coincides fairly closely with the limits of the continuous growth of juniper. Teshik-Tash is situated in a very narrow canyon-like gorge, known as the Zautolosh-Dara *Sai* (fig. 3), a left bank tributary of the Turgan-Darya. It has a single, broad, more-or-less oval chamber 21 m. deep, 20 m. wide, and 7 m. high with a northeasterly exposure (compare figs. 4 and 6). There is a small opening through the ceiling, and it is because of this feature that the site gets its name, since Teshik-Tash means "stone with an opening." In the vicinity of the cave the 40 to 50 m. high cliffs of the Zautolosh-Dara *Sai* are vertical or even overhang slightly in places, so that the sunlight is excluded from the cave mouth near the base of the 15 to 20 m. wide gorge except for an hour or so each day. Some very large rocks fallen from the cliff were found lying in front of the cave where the deposits slope steeply down to the boulder-strewn floor of the deep, narrow gorge (fig. 5). It is estimated that up to one-third of the former deposits in this site have been removed by erosion. During the course of two seasons work the remaining cultural deposits, which totaled 137 sq. m., were completely removed. The area dug in 1938 (78 sq. m.) was conveniently separated from that

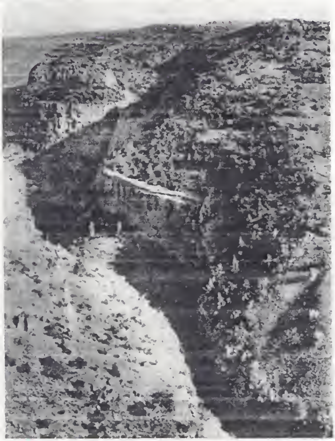

FIG. 3. General view of the Zautolosh-Dara *Sai*, or gorge, a tributary of the Turgan-Darya, in the vicinity of Teshik-Tash. The mouth of the cave is 5,000 feet (1,500 meters) above sea-level and opens to the northeast. This site is located at a point where the canyon-like Zautolosh-Dara *Sai* is only 15 to 20 meters wide with walls up to 40 to 50 meters high that are either vertical or overhang slightly in places. (After Okladnikov, 1940*d*: 359, *upper left*.)

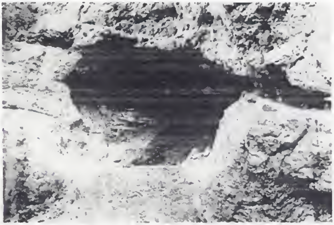

FIG. 4. The cave of Teshik-Tash, literally "Stone with an Opening," is 7.00 meters high at the entrance, 20 meters wide and 21 meters deep. It has the appearance of a broad, more or less oval recess, the floor of which rises gradually up to a rock barrier behind which there is a small inner chamber. (Courtesy of Sovfoto, New York.)

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[5] For preliminary reports and brief summaries of the results of the Teshik-Tash excavations, see Okladnikov, 1939*a*; 1939*b*; 1940*a*; 1940*b*; 1940*c*; 1940*d*; Avdiev, 1942; Efimenko and Beregovia, 1941: 260 (Field, 1948*b*: 28–29, for English translation). In addition to Okladnikov's paper in *Asia Magazine*, brief summaries in English have been published by Bunak, 1945: 22–23; Hrdlička, 1939; Duckworth, 1947; Field and Prostov, 1941; and Field, 1948*a*; for accounts in German and French, see Hančar, 1940: 148–149; 1942: 181–182; 1950: 30; 1952: 78–83; and Vallois, 1940; 1946.

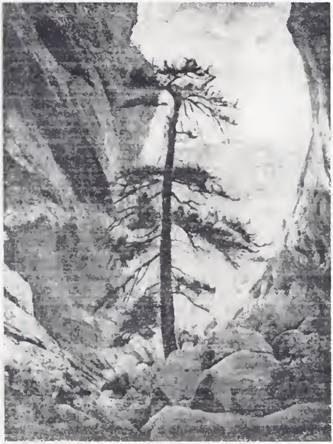

FIG. 5. View looking down the Zautolosh-Dara *Sai* or gorge in front of Teshik-Tash. The cave entrance is visible at the base of the cliff to the left of the tree. Note the size of the boulders lying in the bed of the stream. (*After* Okladnikov, 1949*a*: 16, fig. 2.)

exposed in 1939 (59 sq. m.) by a rocky barrier, as shown on the top-plan (fig. 6). In the southern and eastern portion of the cave, behind this barrier, the surface of the deposits was 1.50 m. to 2.00 m. higher than in the northwestern sector to the right of the entrance.

Teshik-Tash was briefly occupied on five successive occasions, the culture layers being separated from each other by sterile layers of clay, sand, and coarse silt laid down during intervals when the cave was flooded with water. In general the total over-all thickness of these deposits varied from 1.20 m. to 1.50 m. Although it is stated that no single culture layer was over 40 cm. thick, the measurements for the individual strata are not given in the Russian report (Okladnikov, 1949*a*). The stratigraphy is shown in fig. 7; it may be summarized as follows:

A. *Surface Layer*—Sterile clayey soil 5 to 20 cm. thick and of light yellow color. Contains angular limestone debris, as well as large blocks of limestone fallen from the vault of the cave.

B. *Culture Layer I*—The thickest and richest of the various occupation layers. A Neanderthal child's burial, surrounded by a ring of paired horns of Siberian Mountain Goat, was found immediately below this layer. Contained both small and large limestone debris in a coarse brownish-yellow matrix locally hardened by stalagmitic encrustations. Three hearths varying from 50 cm. to 1.00 m. in diameter were found, one of which was immediately above the Neanderthal burial in the northwestern sector of the cave.

C. *Light Gray-Colored Silty Clay*—Sterile. Toward the south and east this deposit, which contains small water-worn limestone particles, lenses out. It exhibits a finely striated structure, and apparently represents a fairly coarse-grained silt laid down during an interval when the cave was temporarily filled with water that was more-or-less stationary.

D. *Culture Layer II*—In the southern and eastern part of the cave this layer merged with Layer I. It is composed of the same dark-colored cave earth and stones as in the case of Layer I. In the center of the area excavated in 1938 a large oval hearth was found.

E. *Light-Colored Silty Clay*—Sterile. This deposit, which was continuous over the entire area, was

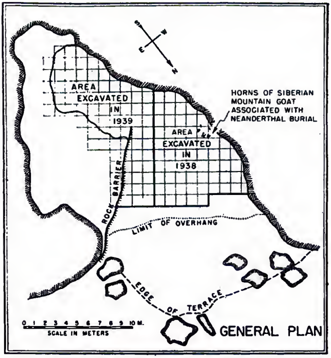

FIG. 6. Ground plan of the cave of Teshik-Tash showing the location of the Neanderthal burial. (*After* Okladnikov, 1949*a*: 20–21, figs. 7 and 8.)

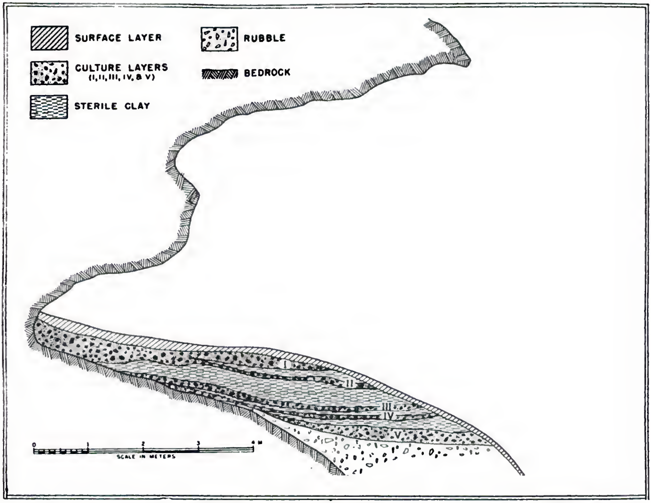

FIG. 7. Section showing the deposits in the cave of Teshik-Tash. Okladnikov states that this was drawn along Line IV, but the location of this "line" cannot be established with reference to the information provided in the site report. (*After* Okladnikov, 1949*a*: 18–19, figs. 4 and 5.)

very similar to that separating Culture Layers I and II.

F. *Culture Layer III*—Compact brownish-colored cave earth containing limestone debris, and locally developed ferruginous and calcareous crusts. Associated with the three circular or oval-shaped hearths in this horizon, several well-preserved pairs of Siberian Mountain Goat horns were found.

G. *Grayish-Brown Silty Clay*—Sterile. A series of thin lenses of both light and dark color were observed in this relatively compact deposit.

H. *Culture Layer IV*—Similar in appearance to Culture Layer III and with a uniform distribution over a fairly wide area. Contained one large hearth (2.00 m. × 1.30 m.) and a smaller one 50 cm. in diameter. Near the rock barrier dividing the cave into an upper and a lower part a concentration of small bones of rodents and birds, believed to be the refuse of large birds of prey, was found.

I. *Light-Colored Compact Silty Clay*—Sterile. This layer, similar in appearance to the overlying sterile deposits, was up to 30 cm. thick.

J. *Culture Layer V*—A thin culture horizon containing three hearths, one of which was 10 cm. thick; it consisted of two bands of ash and rested on stones.

K. *Sterile Debris*—Sterile rubble and clay overlying the irregular and in places fissured bed-rock floor below Culture Layer V.

The five culture layers containing refuse of food, campfires, and artifacts of Mousterian hunters indicate temporary periods of habitation separated by times when Teshik-Tash was vacated and depositionary processes were active. The character of the sterile deposits shows that they were laid down by water in a series of small ponds formed in the narrow valley when the stream was temporarily dammed up by huge blocks that had crashed down from the cliff walls flanking the gorge. During

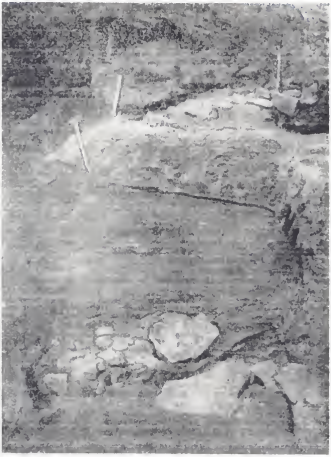

FIG. 8. Section through the Teshik-Tash cave deposits in the vicinity of the Neanderthal burial. At the base: Culture Layer V; above: sterile deposits; and on top: Culture Layer I with which the child's skeleton was associated. (*After* Okladnikov, 1949*a*: 33, fig. 18.)

drier intervals the waters receded, and the occupants once again returned to the site. Now angular material—rock debris and weathering products from the walls and ceiling—accumulated at the same time burying the hearths, and in some cases crushing the bones discarded by the Mousterian hunters. Although Okladnikov believes that a considerable period of time is represented by the sequence of layers at Teshik-Tash, it is also quite possible that the deposits in question were laid down comparatively rapidly. That this was the case is further suggested by the fact that throughout no change can be detected either in the industry or the fauna found at the site.

The burial of a Neanderthal child eight or nine years old was discovered during the 1938 season near the western wall of the cave (fig. 8).[6] The skull, which lay at a depth of 25 cm. below one of the hearths at the base of Culture Layer I, was smashed into more than 150 well-preserved fragments, but it has been almost completely restored. As shown in fig. 9, it was lying on the left parietal with the foramen magnum uppermost. Other bones belonging to this burial include the right femur, the left tibia, two fibula, the left humerus (all lacking the epiphyses), both clavicles, the atlas vertebra, several ribs, and the mandible. These were associated with some irregularly-placed limestone slabs at a slightly lower level in the deposits than the skull (fig. 10). Apparently the body originally lay more-or-less parallel to the western wall of the cave with the feet towards the entrance. Surrounding it five (possibly six) pairs of large horns of Siberian Mountain Goat (*Capra sibirica*) had been arranged in circular fashion with the points downward and slightly inclined toward the skull.[7] Apparently this burial had been disturbed by a beast of prey—perhaps a Cave Hyaena—but the skull had been left pretty well *in situ*. This would explain why some of the parts, including the epiphyses of the long bones, are missing. In fact marks of the teeth of the predator were observed on some of the bones, and in the burial the only coprolite of a carnivore found in the cave came to light. Both its orientation and stratigraphic position suggest that the body had been intentionally buried in a shallow grave pit excavated in the sterile deposits directly below Culture Layer I. But it is a curious fact that no artifacts of any description were found in the actual grave pit,[8] especially in view of the fact that Culture Layer I was extremely prolific of them.

On the basis of the distribution of the archaeological materials, the five successive occupations of

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[6] In addition to the chapters by Gremiatskii, Rokhlin and Sinel'nikov in the main Teshik-Tash volume, summary descriptions of this individual have been published by Debets, 1939; 1940; 1947; 1948: 36–38; 1952: 54–55; Hančar, 1941: 212–213; and Weidenreich, 1945. For illustrations of the skull and Gerasimov's reconstruction of the probable appearance in life of this Neanderthal boy, see Okladnikov, 1940*d*: 426; Field, 1946*a*; Gerasimov, 1949: 71–74. In a recent paper Bunak (1951) has discussed the endocranial cast of the Teshik-Tash skull.

[7] In his monograph Okladnikov (1949*a*: 75–80) discusses at some length the significance of this burial from point of view of possible ideological concepts on the part of the Neanderthal occupants of Teshik-Tash. For an annotated summary in English of this section of the Russian Report, see Movius, 1953*a*: 55–58.

[8] At the base of Culture Layer I above the burial several split long bones of Siberian Mountain Goat were found lying parallel to one another. Between them was a very crude bone point—the only artifact of this type found at the site—but it was not found in the actual grave pit.

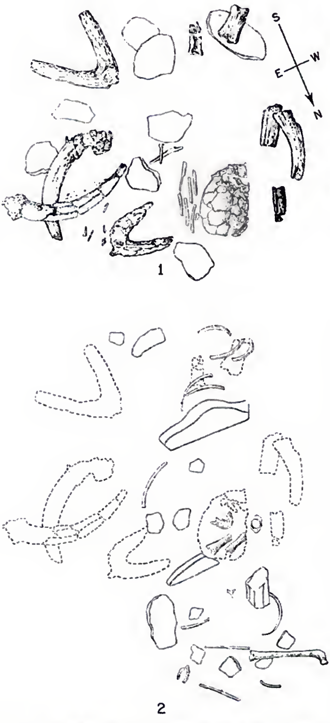

FIG. 9. Neanderthal burial found at the cave of Teshik-Tash. No. 1: Distribution of horns of Siberian Mountain Goat with reference to the skull of the Neanderthal child. (*After* Okladnikov, 1949*a*: 37, fig. 22.) No. 2: The location of the post-cranial skeleton of the Neanderthal child after the skull and goat horns had been removed. (*After* Okladnikov, 1949*a*: 38, fig. 23.)

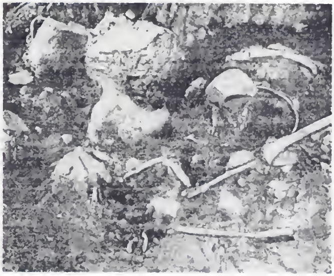

FIG. 10. General view of the burial of the Neanderthal child found at the cave of Teshik-Tash taken just before the skull fragments were extracted. This photo should be compared with the drawing reproduced in fig. 9, no. 2. (*After* Okladnikov, 1949*a*: 41, fig. 28.)

the Teshik-Tash Cave were restricted mainly to the central portion of the area excavated in 1938 (see fig. 6), where they were especially concentrated in the vicinity of the various hearths. Only during the most recent occupation (Culture Layer I) was the rear portion of the chamber occupied. A detailed analysis of the industry from Culture Layers I–V confirms Okladnikov's (1949*a*: 55) conclusion that there is no indication whatsoever of a significant typological change.[9] Therefore the Teshik-Tash assemblage may be considered homogeneous and treated as a whole.

The principal material utilized in the manufacture of implements was the local siliceous limestone, two types of which occur in the Jurassic formations of the Baisun-Tau massif. In addition, small quantities of a light green jasper, quartzite, quartz, and hard compact types of igneous rocks were also used. True flint is exceptionally rare in this region, and only two specimens made of this material were found. The relatively large number of cores and the quantities of refuse material (trimming flakes and chips) indicates that the stone implements were manufactured at the site. The main categories of artifacts found at Teshik-Tash and their distribution by layers is shown in the following table, which calls for no special comment.

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[9] There is absolutely no basis for a three-fold subdivision of the Mousterian in Central Asia, into an "Early," a "Developed," and a "Late" Stage provided by the evidence from this site, as recently claimed by Hančar (1952: 78).

TABLE 1

DISTRIBUTION OF STONE IMPLEMENTS BY LAYERS

Culture layer	Cores or nuclei	Massive implements	Large scrapers	Flakes	Ordinary scrapers	Points	Artifacts with Graver-type retouch	Totals	
								Tools	Trimming flakes and chips
I (1)	37	1	4	32	16	7	1	98	1,102
II (1b)	11	—	—	11	4	3	—	29	187
III (2)	11	1	2	21	8	4	—	47*	324
IV (2b)	15	—	3	10	2	4	—	34	206
V (3)	27	—	1	60	25	6	2	121	701
Totals:	101	2	10	134	55	24	3	329	2,520

* Incorrectly given as 57 in Okladnikov, 1949: 55, table I.

The percentages of classifiable artifacts to trimming flakes and chips found in each of the horizons are: Layer I—8.9 per cent; Layer II—15.5 per cent; Layer III—14.5 per cent; Layer IV—16.5 per cent; and Layer V—17.3 per cent, the average being 14.5 per cent. Of the grand total of 2,849 finds listed, 329 are classified as tools, whereas 2,520 are considered to be trimming flakes and chips, some showing signs of use. Almost one-third (total: 101) of the artifactual material from Teshik-Tash falls in the core or nucleus category. The leading type is a very characteristic Mousterian form; it is carefully prepared bifacial, discoidal core (fig. 11, nos. 1, 3, and 4). In addition, there are some roughly triangular and elongated oval cores (fig. 11, nos. 2, 6, and 7), a few prismatic types (fig. 11, no. 5; total: 5), and a fairly large series of irregularly-shaped examples. In the majority of instances the circumference of the biracially flaked discoidal cores is markedly sinuous as the result of the removal of a series of more-or-less symmetrical alternating flakes, first from one surface, then from the other, by directing the successive blows at the opposing platforms along the periphery of the object. The jagged and bruised edges of many of these cores indicate secondary use as choppers and chopping-tools. A direct percussion technique appears to have been employed throughout in detaching the alternating primary flakes from these bifacial cores, a very large number of which have been used down to the end and discarded only when no longer serviceable.

In addition to the two artifacts (both hand-axe type tools) included in the massive implement category by Okladnikov (see table 1), certain of the largest of the scrapers (Russian: *skreblo*) unquestionably should be included here, as discussed elsewhere by the present writer (Movius, 1953*a*: 34). The two hand-axe type tools, one of which is shown in fig. 12, no. 1, are both very superficially flaked in a bifacial manner and are more-or-less pointed at one end. In each case the butt is thick and only crudely worked. Actually neither of these objects is a true hand-axe; rather their main function seems to have been for chopping or cutting, as indicated by the secondary flaking along the sides. Indeed the pointed ends of these tools have scarcely been trimmed at all, although along either one or both sides wide, flat flakes have been detached. The small series of large choppers (total: 3) fall into two sub-types: (*a*) with a single convex cutting edge opposite a thick unworked butt end producing a triangular-shaped longitudinal section (fig. 12, no. 2); and (*b*) with two cutting edges, one convex and the other forming a right angle with the butt (fig. 12, nos. 3 and 5). On several of these massive implements, the secondary flaking of which is normally of the steep or resolved variety, the original weathered crust of the limestone adheres.

Only in a few instances are the implements classified as large scrapers (fig. 12, nos. 4, 6, and 7) made on flakes. They are up to 7 cm. long and 6 cm. wide with a straight or slightly convex cutting edge that is steeply retouched, and very often exhibits characteristic step-flaking. Several of these large scrapers, some of which have the

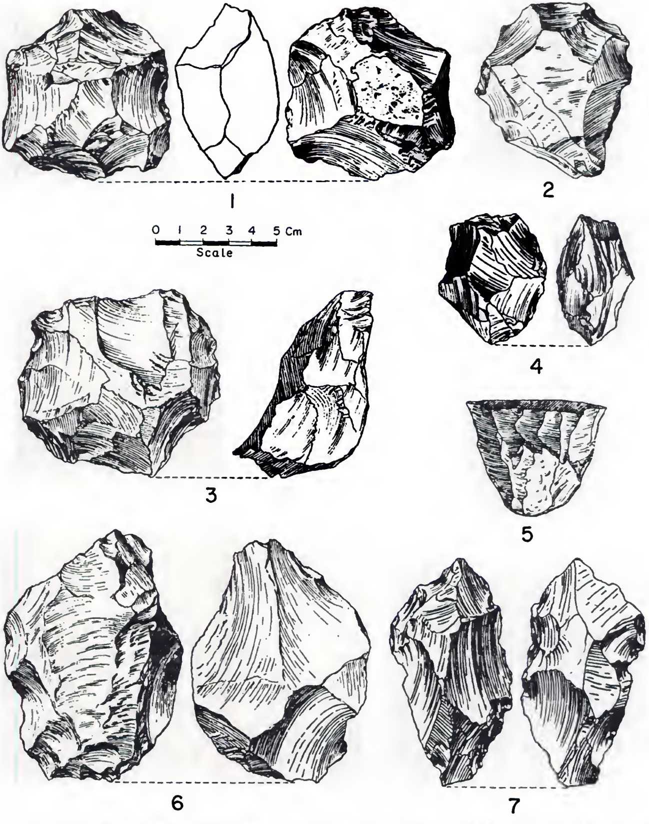
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FIG. 11. Cores from the Cave of Teshik-Tash. Nos. 1–3 and 5 from Layer I; nos. 4 and 7 from Layer IV; and no. 6 from Layer V. (*After* Okladnikov, 1949*a*.)

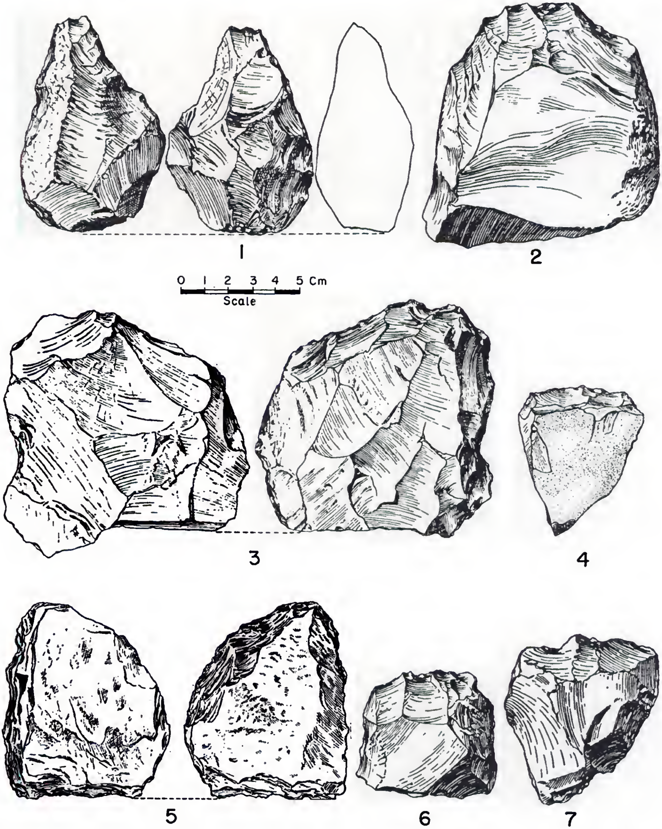
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FIG. 12. Heavy implements from the Cave of Teshik-Tash. Nos. 2, 4 and 6 from Layer I; nos. 1, 3 and 5 from Layer III; and no. 7 from Layer V (? or IV). (*After* Okladnikov, 1940*b*: fig. 3, no. 2; and 1949*a*.)

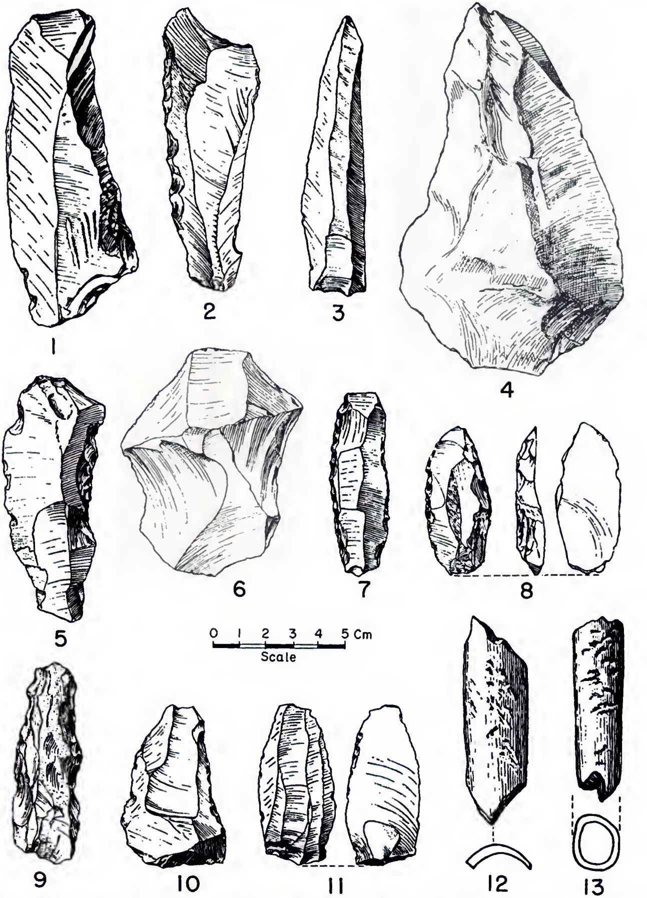
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FIG. 13. Flakes and flake-blades of various types, as well as "retouchers" or "flakers" of bone (nos. 12 and 13), from the Cave of Teshik-Tash. Nos. 1–4, 6, 9, 12 and 13 from Layer I; no. 8 from Layer III; and nos. 5, 7, 10 and 11 from Layer IV. (*After* Okladnikov, 1940*b*: Fig. 4, nos. 9, 10 and 11; and 1949*a*.)

original crust of the nodule on the upper surface, are of triangular outline. Others are roughly oval, rectangular, or even square.

Artifacts in the flake category [10] constitute 41.73 per cent of all worked tools from Teshik-Tash (total: 134) and are the largest single class of implement. Flakes, which range in size up to over 10 cm. long (fig. 13, no. 4), of both oval and triangular form, as well as elongated types that may be considered either as coarse blades or as flake-blades (fig. 13, nos. 1–3 and 5), are represented. In some cases a portion of cortex adheres to the upper surface, but the majority have been carefully prepared on the core prior to detachment. According to Okladnikov (1949*a*), a total of 33 flakes recall the Levallois type, although no tortoise cores are described from the site. Flakes with faceted striking platforms are stated to occur, although this feature is not indicated in the illustration of the only flake of Levallois type reproduced in the Russian report (compare fig. 13, no. 6). But it is apparent that the upper surface of this specimen is covered with wide flat flake facets which have been directed from the sides toward the center of the object in the best Levallois tradition, prior to its detachment from the core. The bulbs of percussion in the flake series as a whole are normally at the proximal end; however, there are some examples where they are located obliquely at one side, a typical feature of other classic Mousterian assemblages. A large proportion of the flakes and flake-blades exhibit traces of edge-chipping, or irregular notches resulting from use (fig. 13, nos. 2 and 5), and some have been carefully retouched along either one or both edges as cutting or scraping implements (fig. 13, nos. 7, 8, and 10). Finally, there are a few examples of elongated flakes with more than three scars on the upper surface (e.g., fig. 13, no. 11), which indicates very careful preparation on the core prior to detachment.

In the flake category Okladnikov (1949*a*) includes two specimens of what are very probably *limaces,* or slug-shaped artifacts (fig. 13, no. 9). The illustrated specimen is a thick, parallel-sided, blunt-ended tool with steeply retouched edges. Since the *limace* is very typical of the classic Mousterian of Western and Central Europe, its occurrence (one definite and one possible example) at the Cave of Teshik-Tash is a fact of great interest.

Many of the ordinary side-scrapers from this site are made on flakes that are broad relative to their length (fig. 14, nos. 1–4). The working edge is normally opposite the bulb of percussion, and in some cases a portion of the crust is exhibited on the upper surface. According to Okladnikov (1949*a*), several of the side-scrapers from Teshik-Tash are made on Levallois-type flakes with faceted striking platforms. Double side-scrapers occur, but they are rare. The secondary working is steep and rather coarse, with stepped or resolved flaking along the edge, which is usually straight or convex, although a few examples are slightly concave. In all essential features the series of side-scrapers from Teshik-Tash may be considered as typically Mousterian.

A total of 24 points (7.29 per cent of all worked artifacts) were found. These are made on triangular or pointed leaf-shaped flakes with the bulb of percussion normally situated opposite the pointed end, although occasionally this feature is located obliquely with respect to the long axis of the artifact. The steep or resolved retouch along both edges on either side of the point on the upper surface is a characteristic feature (fig. 14, nos. 5, 6, 8, and 9), although some examples are stated to be worked only on the bulbar face. Two basic sub-types are represented: (*a*) forms made on long narrow flakes with a triangular section (fig. 14, nos. 7–10); and (*b*) those made on relatively broad, thin, leaf-shaped flakes (fig. 14, no. 11), many of which are asymmetrical (fig. 14, nos. 5 and 6). In a few cases the upper surface of the bulbar end has been trimmed to reduce thickness, and a few examples with broken tips have been reworked and used as scrapers. Fig. 14, no. 9, made on a long narrow flake with a faceted striking platform, shows one of the few points with a curved outline found at the site.

According to table 1 only three artifacts with graver-type retouch were found at Teshik-Tash—one in Layer I and two in Layer II—but in the text a total of seven are described. The illustrated specimen (fig. 14, no. 12) is made on a small piece of limestone from which five graver-type flakes have been detached. Thus, just as in the developed Mousterian of Western Europe, gravers occur sporadically in the assemblage from Teshik-Tash.

Okladnikov (1949*a*) describes several water-rolled limestone pebbles with marks of percussion

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[10] Including long, parallel-sided flakes or blades in which the length-breadth ratio is greater than 2 : 1. Most of these have been manufactured by a flaking technique (as opposed to a true blade technique) at Teshik-Tash, and consequently should be classed as flake-blades.

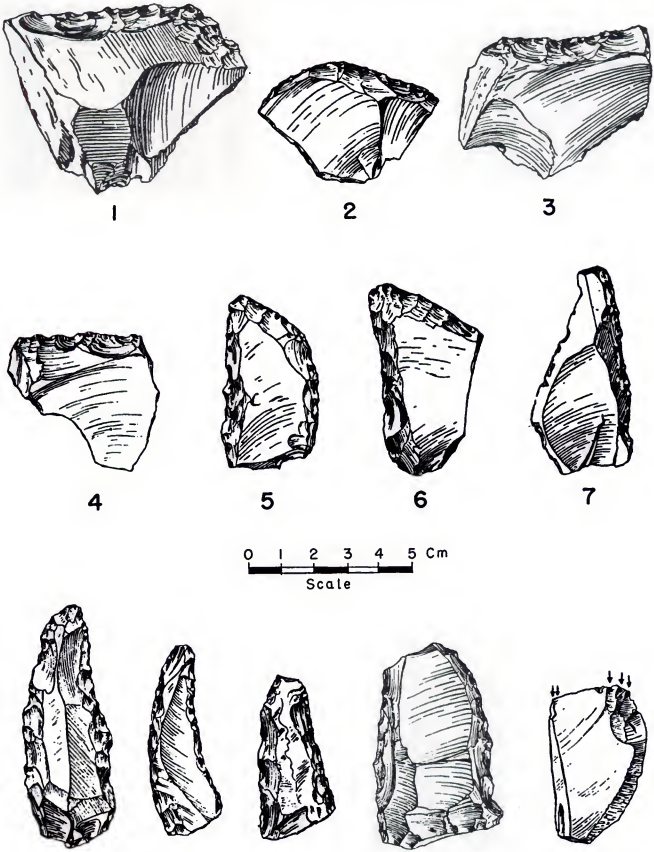
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FIG. 14. Side-scrapers, points, and flake with graver-type retouch from the Cave of Teshik-Tash. Nos. 9 and 12 from Layer I; nos. 1–6, 8, 10 and 11 from Layer IV; and no. 7 from Layer V (? or IV). (*After* Okladnikov, 1949*a*.)

on them, believed to be hammer-stones, from various of the culture layers at this site. He further suggests that one small egg-shaped example, which exhibits no traces of use, may in fact represent a bolas stone.

Although many of the animal bones found at Teshik-Tash exhibit incisions, scratches, and cuts, very probably produced during the process of separating meat or sinews from the bone, these cannot be considered as artifacts. And the same applies to the very numerous long bones that had been broken and split into small fragments, presumably for the extraction of marrow. But there are some typically Mousterian "retouchers" or "flakers" (fig. 13, nos. 12 and 13), made of fairly large fragments of long bone of the Siberian Mountain Goat split longitudinally. These exhibit characteristic notches and incisions resulting from the pressure of the sharp edge of a stone being repeatedly worked in the same place on the surface of the bone. As stated on p. 390, n. 8, the only pointed bone artifact found at this site, came to light at the base of Culture Layer I just above the Neanderthal child's burial. This object, which possibly served as a crude awl, is made on a portion of the ulna of a Mountain Goat on which a long tapering point has been fashioned at one end. Okladnikov (1949*a*: 66) considers that the working of bone during Mousterian times was based on knowledge acquired from wood-working, but the evidence on which this statement is based was secured at Amir-Temir (see p. 400) and not at Teshik-Tash. For a small piece of charcoal of juniper preserved in the very damp Mousterian deposits at the Cave of Amir-Temir is stated to exhibit traces of wide intentional cuts, so clearly defined and regular that they must have been made by a stone tool held in the hand of man. Whereas this point cannot be proved, Okladnikov suggests that it was the experience gained by the Neanderthalers in working wood and bone during Mousterian times that "paved the way for the excellent technique of working bone, so typical of the Upper Palaeolithic" (Okladnikov, 1949*a*: 66).

The typology of the stone tools from Teshik-Tash, as well as the technique employed in their manufacture, leaves no doubt concerning the Mousterian affinities of this assemblage. And this observation is in accord with the discovery of a Neanderthal child's burial directly beneath Culture Layer I inside the cave. Typical Mousterian forms include: discoidal nuclei, a few core tools. Levallois-type flakes, and scrapers and points with resolved or step flaking, as well as one *limace* (or slug-shaped flint) and one probable artifact of the same type. But in a sense certain other features foreshadow the Upper Palaeolithic, as Okladnikov (1949*a*: 68) points out. This applies particularly to the presence of thin elongated flakes —blades or flake-blades that were detached from well prepared cores—and several prismatic nuclei. Taken as a whole, however, the Teshik-Tash industry is very typical of the Developed or Final Mousterian of Western Europe, although the occurrence of choppers and chopping-tools may be taken as indicating the persistence here of the East and South-East Asiatic Palaeolithic tradition.

A study of the mammalian remains from the

TABLE 2

List of forms	Common name	Total number of bones	Total number of individuals
Capra sibirica Meyer	Siberian Mountain Goat	760	38
Cervus sp.	Deer (*Khangul* or *Tugainyi*)	1	1
Equus caballus L.	Wild Horse	2	1
Ursus arctos L.	Common Brown Bear	2	2
Hyaena sp.	Hyaena	1	1
Felis pardus L.	Leopard	2	2
Marmota sp.	Marmot	17	6
Cricetulus migratorius Pall.	Gray Hamster	11	6
Microtus cf. *carruthersi* Thos.	Carruther's Vole	6	4
Microtus sp.	Common Vole	1	1
Ellobius talpinus Pall.	Mole Lemming	19	6
Rattus cf. *turkestanicus* Sat.	Turkestan Rat	1	1
Muridae Indeterminatae	Miscellaneous Mice	70	—
Diromys nitedula Pall.	Forest Dormouse	1	1
Ochotona sp.	Pika or Tailless Hare	11	7
Lepus aff. *tolai* Pall.	Hare (akin to the *Tolai*)	2	1
Totals:		907	78

TABLE 3

List of forms		Total number of bones	Total number of individuals
Alectoris Kakelik (Falk.)	Asiatic rock-partridge	9	2
Perdicinea (Genus?)	Partridge subfamily	2	2
Columba Rupestris Pall.	Bar-tailed rock pigeon	4	2
C. livia L.	Crag or rock pigeon	6	2
C. sp.	Dove (species unknown)	2	1
Anas sp.	Duck (species unknown)	3	1
Falco tinnunculus L.	Common kestrel	6	2
Otus cf. *scops* L.	Scops owl	1	1
Genus? aff. *Asio*	Owl-like form	1	1
Apus apus (L.)	Swift or black martlet	2	1
A. melba (L.)	Alpine swift	1	1
Corvus frugilegus L.	Rook (crow or raven)	1	1
C. sp.	Rook (species unknown)	1	1
Pyrrhocorax pyrrhocorax L.	Chough	2	1
Corvidae (Genus?)	Rook family	1	1
Emberiza calandra L.	Yellow or corn bunting	1	1
Genus? aff. *Emberiza* L.	Bunting-like form	3	2
Genus? aff. *Motacilla* L.	Wagtail-like form	1	1
Genus? aff. *Anthus* Bech.	Pipit-like form	2	2
Turdus aff. *merula* L.	Thrush or blackbird	3	1
Incertae Familiae	Family doubtful	9	—
Totals:		61	27 (Minimum)

five culture layers at Teshik-Tash, identified by V. I. Gromova (1940; 1949), indicates that no significant change occurred during the time the cave was occupied, which agrees with the evidence of the stone implements. Gromova's list may be summarized in table 2.

In all essential respects this fauna is composed of forms which today are typical of the alpine and boreal-scrub zones of the Baisun region. Even the Leopard and the Wild Horse still live in Russian Turkestan; only the Hyaena is now extinct. On this basis it is apparent that environmental conditions in this part of Central Asia were substantially the same during the time of the Mousterian occupation of Teshik-Tash as those obtaining at present. And the vertebrate remains found in the contemporary levels at Amir-Temir (see p. 402) support this conclusion. Furthermore at both of these localities the main activity of the Mousterian occupants was hunting the Siberian Mountain Goat, or *Kiik*; of all the vertebrate remains from this site, it is estimated that some 78 individuals are represented by the 907 fragments of bones, teeth, and horns of *Capra sibirica*. Indeed the overwhelming majority of all the material (760 pieces; 83.79 per cent) belong to this animal.

Although Teshik-Tash is the only Palaeolithic site known to date where remains of Mountain Goat predominate, there are other Mousterian localities where other animals are almost equally characteristic. At Il'skaia in the Northern Caucasus, for example, 60 per cent of all identifiable individuals consist of Bison, and S. N. Zamiatnin (1929; 1935*a*; see also Gorodtsov, 1941) estimates that the Il'skaia hunters killed some 2,400 bulls. Furthermore, at certain Alpine sites the bones of the Cave Bear predominate. Thus at Wildkirchli in Eastern Switzerland at least 1,000 individuals of this species were found (Bächler, E., 1930*a*; 1930*b*; 1940; Bächler, H., 1947; 1949), while at Drachenhöhle, near Mixnitz (Styria), many thousands of Cave Bear bones, including a large series of skulls, were excavated (Abel, 1926; Abel and Kyrle, 1931). In each case, the main activity of the occupants of these sites appears to have been hunting the game animal which was predominant in that particular region. As is the case today, the Baisun-Tau Mountains must have been an ideal place during Mousterian times for the Mountain Goat, and for this reason the Neanderthal occupants of the cave were attracted to settle here in order to obtain meat, which was their chief source of livelihood.[11]

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[11] For a discussion of the general mode of life of the prehistoric occupants of Teshik-Tash, especially with regard to methods of hunting the Siberian Mountain Goat,

The bird bones from Teshik-Tash were studied by P. V. Suslova (1949), who has identified the forms listed in table 3.

As in the case of the mammals, all of these forms are typical of those now living in the alpine, scrub-forest zones of this region. The avifauna supports the conclusion, therefore, that the environment at the time of the Mousterian occupation of this site seems to have differed in no very marked degree from that of the present.

It is not possible as yet to tie the Teshik-Tash deposits into the general frame of the Pleistocene as a whole, but as discussed on page 383, the glacial succession in Central Asia has only been very sketchily worked out by geologists. Nevertheless, the present facts most emphatically do not support the hypothesis propounded by Okladnikov (1949*a*: 69–71) and Gromova (1949: 98–99) that the Mousterian occupation of Teshik-Tash is early—either Mindel-Riss or immediately post-Riss.[12] Although a Mindel-Riss dating of the Mousterian has been accepted by Hančar (1952: 79), this claim completely overlooks the evidence provided by the fauna from the site. In every respect the assemblages listed above are Upper Pleistocene, and it is almost inconceivable that they could belong to an older stage, e.g., Mindel-Riss, without a single typically Middle Pleistocene form being included. In any case this establishes a lower limit which, by analogy with the forms now inhabiting this region, probably indicates that Teshik-Tash should be placed in the Riss-Würm (or Third) Interglacial. However, the possibility that the occupation is even younger (the Central Asiatic equivalent of the Würm I/II Interstadial in terms of the Alpine sequence) cannot be ruled out. Certainly before one can be dogmatic concerning the age of these important cave deposits, a very great deal more joint geological-paleontological-archaeological research on the Pleistocene problems of and the Palaeolithic succession in Central Asia is a vital necessity. In the meantime, it seems likely that the Mousterian occupation of the Baisun region should be tentatively assigned to the Third Interglacial. For the sum total of the evidence obtained at this site suggests that its deposits were accumulated during a relatively late stage in the Pleistocene history of Russian Turkestan when the mountain landscapes had acquired more-or-less their present appearance, and when the fauna (both mammals and birds) was practically identical with the contemporary assemblages. Furthermore, the charcoal from Amir-Temir (see below) demonstrates that the same juniper forests grew in the vicinity of the cave during Mousterian times as one finds in the region today. In the light of what we now know concerning the Pleistocene sequences in various sections of Eurasia, there is certainly no justification whatsoever for the Russian claim that Teshik-Tash dates from Mindel-Riss times.

Amir-Temir, Baisun Region, Uzbekistan

The Cave of Amir-Temir, which means "Tamerlane's Cave," is situated in a deeply-cut gorge or *sai* of the same name less than 5 km. (3 miles) from Teshik-Tash, as shown on the map (fig. 2). It opens to the northeast and is actually a very large crevice dominated by a huge cliff. Test digging conducted here in the 1939 season in the main chamber of the site (Okladnikov, 1940*e*; 1945; 1949*a*) led to the recognition of the following three culture horizons:

A. A series of three ashy deposits at the base of the surface soil produced several triangular arrowheads and a sherd of crude pottery with a handle. (Thickness not given.)

B. In the typical cave earth mixed with gravel, which merges with the overlying ashy deposits, a hearth was found. Thick crude pot-sherds were associated with this feature, together with the following stone artifacts: a cylindrical stone pestle, a series of utilized flakes, a large scraper made on a broad flake, and a series of nucleiform implements. In a small pit near the hearth some bones of domestic animals, including goat, occurred. (Thickness not given.)

C. A thin but nonetheless clearly-defined third culture horizon was found at a depth of 1.00 m. below the surface. This consisted of an oval hearth 1.50 m. long and 1.00 m. wide which produced some stone tools of Mousterian type and several rather large fragments of charcoal of juniper that had been preserved owing to the prevailing humidity. One of these pieces has a pointed end and seems to exhibit traces of cutting.[13] (Thickness not given.)

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see Okladnikov, 1949*a*: 75–80; for a summary in English, see Movius, 1953*a*: 52–55.

[12] One even wonders how much "forcing" of the evidence, conscious or otherwise, there has been in this instance on the part of the Russian scientists. For, as Škerlj (1951: 59) has recently observed: "The Soviet anthropologists still hold the view that the Neanderthalians must be our direct ancestors, and they put the Mousterian (e.g., Teshik-Tash and Aman-Kutan) into the Second Interglacial. If the facts don't agree with the 'theory' once accepted . . . the worse for the facts. . . ."

[13] Okladnikov (1949*a*: 66) states that the traces of wide, intentional cuts on this large fragment of charcoal are so clearly defined and regular that they could have

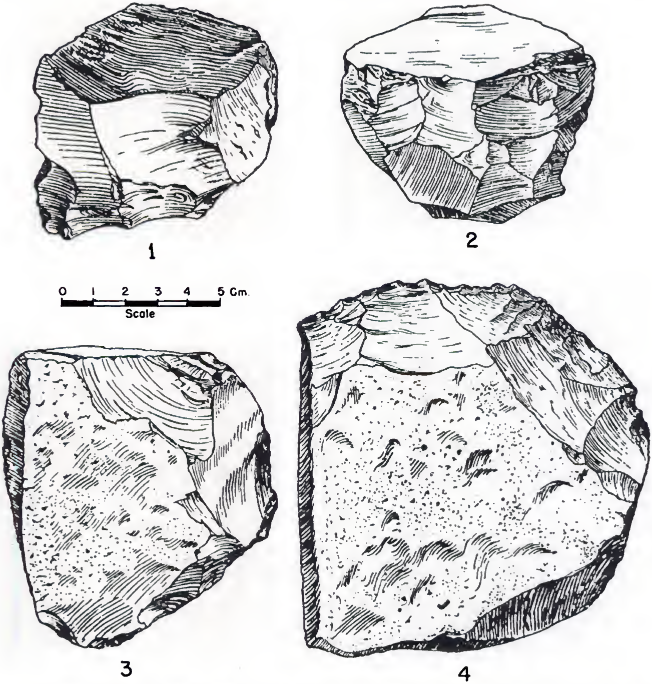

FIG. 15. Stone implements of Mousterian type from Amir-Temir, near Teshik-Tash. Nos. 1 and 2: cores or nuclei; no. 3: crudely worked fragment of limestone; no. 4: chopper or massive scraper. (*After* Okladnikov, 1940*c*: 69, fig. 13.)

Associated with the hearth in Horizon C there were only a few stone implements; the total inventory consists of (*a*) an unspecified number of crude flakes of dark-gray siliceous limestone, (*b*) several large cores of limestone with a few flakes detached from each of them, (*c*) a typical large scraper or chopper (*skreblo*) and (*d*) a few nuclei. One of the latter is considered to be a very crude discoidal core (fig. 15, no. 1), while the second is a prismatic type (fig. 15, no. 2) similar to one found in Culture Layer I at Teshik-Tash (fig. 11, no. 5). As Okladnikov points out, these cores are crude examples of one of the prevailing types found in sites of the Upper Palaeolithic. Fig. 15, no. 3, is one of the large superficially flaked blocks of limestone that shows signs of use, possibly as a chopper, along one edge. The large scraper or chopper (*skreblo*) shown in fig. 15, no. 4, is mas-

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been made by a metal tool, although obviously a sharp stone flake must have been employed.

sive and heavy. It is made of a limestone slab, exhibits the original crust on both surfaces, and a convex working edge formed by the removal of steep, wide flakes. It is very similar in all essential respects to the *skreblo* found in the Mousterian deposits at Teshik-Tash (see p. 392 and fig. 12, nos. 2 and 5).

The fauna from Horizon C at Amir-Temir, despite its scarcity, is very like that from the Cave of Teshik-Tash, and here the Siberian Mountain Goat (*Capra sibirica*) also predominates. But this site only served as a very temporary refuge for the Neanderthal hunters of Mousterian times, since animal bones and stone artifacts, relatively abundant at the former locality, are very scarce at Amir-Temir. Apparently this site was always damp, cold, and dark—exceedingly uncomfortable for habitation, notwithstanding its large dimensions. Thus, as Okladnikov points out, it is not surprising that the Middle Palaeolithic peoples who lived in this region preferred the neighboring high, relatively dry and light Cave of Teshik-Tash.

Katta-Kurgan, near Machai, Uzbekistan

The Cave of Katta-Kurgan, also known as the Machai Cave, is situated on the right bank of the Turgan-Darya between the twin villages of IUkary-Machai and Katta-Machai in the Baisunskii region of the Uzbekistan S.S.R. (fig. 2). This site was discovered by Parfenov (1934; Okladnikov, 1949: 8), and it is an easily accessible cave cut in an outcrop of Jurassic conglomerates. Okladnikov (1945) gives the stratigraphy as follows:

A. Ashy layer with fragments of charcoal and sheep dung ....40 cm.
Contains tools of flint and bone; pottery was present only in the *upper part* of the layer.

B. Yellowish-colored cave earth....(Thickness not given.)
On top of the gravel which constituted the lower portion of this layer an elongated triangular point of green jasper with steeply retouched sides was found.

Many of the bones in the upper layer, some of which had been split and showed traces of burning, were those of birds and small animals. A large number of flint flakes, in addition to a core and a percussion tool of dark gray limestone, attest the fact that the manufacture of stone tools was carried out on the spot. In the test pit Parfenov found arrowheads of flint, associated with elongated knife-shaped flakes and scrapers. The upper portion of Horizon A yielded pot-sherds of a decorated vessel with a curved linear design over which red stripes had been painted; also an animal figurine crudely modeled in clay. Together with these finds there occurred remains of cultivated plants, among them cereals (Voronets, 1937; Masson, 1937, Okladnikov, 1945). But only chipped stone tools and no pottery or remains of cultivated grains were found in the lower portion of the layer, which is believed by Okladnikov to date from Mesolithic times and is thus shown by him on his correlation table (Okladnikov, 1949*a*: 82, table 6).

As regards the finds from the lower layer (Horizon B) very little has been published as yet. Okladnikov (1949*a*: 80, footnote 1) simply states that he examined a portion of the finds from the Machai Cave of Katta-Kurgan, which are now stored in Tashkent (Museum of History, Academy of Sciences, Uz.S.S.R.), and identified typical Mousterian artifacts, including several triangular points analogous to those from Teshik-Tash (see p. 396), among the materials from the lower layers. On this basis, it is hoped that further excavations will be conducted at this potentially important site in the near future.

LATE UPPER PALAEOLITHIC OR MESOLITHIC (?) SITE

It is curious that, notwithstanding the fact that a dozen or so cave and open-air sites in the Baisun region have been investigated to date, none of them have yielded any indisputable evidence of occupation during Upper Palaeolithic times. On the basis of the typology of the stone implements from one locality, however, Okladnikov believes that he has secured evidence for a Late Upper Palaeolithic or Mesolithic occupation in Southeastern Uzbekistan.

Airatama, East of Termez

The materials found near the village of Airatama, on the right bank of the Amu Darya 17 km. (10.6 miles) east of Old Termez (fig. 2), are regarded by Okladnikov (1945; see also Avdiev, 1942: 71) as probably of Late Upper Palaeolithic or Early Mesolithic age. This series consists mainly of heavily patinated flint blades, and they are believed to be definitely attributable to a pre-Neolithic horizon. Similar blades have also been found at the locality on Komsomol Lake, east of Samarkand (see p. 406), which Okladnikov (1945) likewise assigns to the end of the Palaeolithic or to the Mesolithic. No stratigraphic evidence pertaining to the Airatama site is available, and the brief references to it in the literature imply that the dating is entirely based on typological considerations.

MISCELLANEOUS SITES

As stated on page 385, Okladnikov and Zaporozhskaia tested by six localities in the Baisun region during the years 1938–1939, but brief descriptions of only four of them have been published. Also they found stone tools at the site of Old Termez. The pertinent data concerning these stations are summarized below.

Zarangat-Gut

Apparently this cave is situated in the Baisun region, but its location is not shown on Okladnikov's map, Okladnikov, 1945: 67, fig. 12). Test excavations were conducted here during the 1938 season. The cave is 3 meters high × 15 meters deep × 40 meters long and is located at the end of a long deep ravine. At the entrance big limestone boulders fallen from the roof were found, and at the rear of the main chamber there was a small clear pool of freshwater. The stratigraphy is given by Okladnikov (1945) as follows:

A. Compact gravelly earth ....30 cm.
B. Loose earth containing gravel, limestone slabs and dark layers ....60 cm.
One of the dark layers yielded charcoal, splintered and charred animal bones, and a flint blade.
C. Loose earth and stones... (Thickness not given.)
Only a few isolated fragments of charcoal, some animal bones and an occasional flint blade were found in this layer.

On the basis of the typology of the flint artifacts, Okladnikov considers that possibly this cave was occupied as early as Mesolithic times.

Dukan-Khan

This is also a site that was tested by Okladnikov and Zaporozhskaia in 1938, the precise location of which is not given (compare Okladnikov, 1945: 67, fig. 12). But it almost certainly lies in the Baisun region in the drainage of the Turgan-Darya. Dukan-Khan is described by Okladnikov (1945) as a much-weathered and partially destroyed rock-shelter. In it a crude prismatic nucleus and a small scraper made on a flake were found in association with some charcoal at a depth of 30 cm. This occupation is considered to be probably contemporary with Horizon C (?Mesolithic) at Zarangat-Gut.

Temir-Ul'de

In 1939 test excavations were conducted by Okladnikov (1945) in the vicinity of the town of Baisun, near the town of Aulat, where the Cave of Temir-Ul'de is located (fig. 2). Only part of this site, which is situated in a small gorge, is preserved owing to a cave-in. However, portions of a rather extensive culture layer were observed over the entire site. It is up to 30 cm. to 50 cm. thick and contains a heavy concentration of ashes together with scattered animal bones and stone implements. Among the latter is a thin blade of dark flint and a massive scraper of siliceous limestone with a convex working edge. Still deeper more charcoal and a second crudely retouched artifact occurred. Excavations at this locality, which Okladnikov (1949*a*: 82, table 6) has tentatively assigned to the Mesolithic, give promise of yielding very interesting and significant results.

Kurgan-Dar'ia

This is a second site near Baisun (see fig. 2), where test excavations were conducted in 1939 (Okladnikov, 1945). Crude flakes of silicified limestone and a side-scraper were found in this cave. Both of these finds came to light in the second culture layer, which was of a darkish color and occurred at a depth of 1.50 m. below the surface. It is considered likely that excavations at this site will demonstrate the presence of a Middle Palaeolithic occupation layer.

Old Termez

According to Okladnikov (1945), the following types of stone tools were found during the course of the excavations at Old Termez: conical nuclei, utilized flakes with or without retouch, knife blades (common), end-of-blade scrapers (rare), and gravers or burins (rare). In his opinion "to judge from the technique of manufacture these artifacts cannot be older than the Upper Palaeolithic or younger than the Early Bronze Age." No illustrations of this series are available; the location of Termez is shown on the maps, figs. 1 and 2.

Thus in the Baisun region and adjacent portions of Southeastern Uzbekistan there are a large number of Palaeolithic and Mesolithic sites, of which Teshik-Tash is the only one that has been completely excavated. But, in addition to this now-famous cave, it is understood that the Institute for the History of Material Culture of the U.S.S.R. Academy of Sciences intends to sponsor additional projects which have as their objective a broader knowledge of the pre-Neolithic stages of human cultural development in this part of Central Asia. For there is no doubt whatsoever that further investigations in this comparatively little known region will supplement in substantial measure our present knowledge of the Palaeolithic-Mesolithic sequence of Uzbekistan, one phase of which is so well represented at the Cave of Teshik-Tash.

THE SAMARKAND REGION

In marked contrast with the Jurassic limestone uplands of the Baisun-Tau, there are very few caves in the high plains region surrounding Samarkand. But vast areas of this country are still completely unexplored. Here it is very likely that future archaeological work will lead to the discovery of open-air settlements, a fact which is indicated by recent investigations elsewhere in Central Asia—e.g., the Neolithic occupation sites in the foothills of the Kopet-Dagh and in the deserts of Turkmenia (Okladnikov, 1949*a*: 10), as well as in Khorezm (Kel'teminar Culture) on the lower reaches of the Amu-Darya (Tolstov, 1948*a*: 59–66; 1948*b*: 67–71; Field, 1946*b*: Hančar, 1950: 57–58), but thus far only a few sporadic finds have been reported. At Komsomol Lake, near Samarkand, Stone Age artifacts have been found at an open-air site, and several human implements have been reported from sands and gravels exposed on Ovrashnaia Street in the city of Samarkand itself. Even more recently the Cave of Aman-Kutan has been excavated north of the town of Kitab and 43 km. (26.9 miles) south of Samarkand, yielding additional evidence that Russian Turkestan was occupied during Middle Palaeolithic times (see fig. 2 for location). It is therefore apparent that additional interesting and significant discoveries will inevitably accrue as further work is conducted in this important region. In the meantime, the significant facts pertaining to each of the localities thus far reported in the Samarkand region will be presented.

MOUSTERIAN AND "PRE-MOUSTERIAN" SITES

Ovrashnaia Street, Samarkand

During the excavation of a ditch 30 meters northwest of the intersection of Ovrashnaia and Engels Streets in the city of Samarkand two stone artifacts—a flake and a typical Mousterian-type point—were discovered in a sandy and gravelly layer at a depth of 2.50 meters below the surface (Grigor'ev, 1940). Both of these objects were made of the same fine-grained siliceous limestone as is found in the Baisun-Tau Mountains. The section, which is exposed on the south side of a nearby ravine, is as follows:

A. Recent culture layer with Medieval remains. 50 cm.
B. Thick deposit of water-laid and partially cemented sandy gravel, interrupted by layers of loessic silt, in places up to 50 cm. thick.......3.00 m.
C. Deposit of loess up to 1.50 m. thick.

The point, which was unrolled, was found 1.40 m. above the base of the loess in Horizon B, and the flake, which was rather heavily rolled, came to light in the same sandy gravel stratum some 5.00 m. to the northwest. The point (fig. 16) is made on a typical wide triangular flake apparently struck from a discoidal core with a prepared striking-platform. The bulbar end is fairly thick, while the edges adjacent to the point exhibit very characteristic steep Mousterian retouch, and there is fairly extensive working along the lower side of the right edge. Unfortunately, the pointed end has been broken. Although the object is unrolled, it is assumed that it was derived from some place higher up along Ovrashnaia Street, since there is no indication of an actual culture layer at this locality. Apparently the artifact-bearing deposit represents an alluvium that was washed into the former bed of a side stream which once flowed into the now-abandoned Siabch irrigation ditch. It is probable that this stream originated in the highlands just over 15 km. (9 miles) from the site. Although the geologic age of these deposits

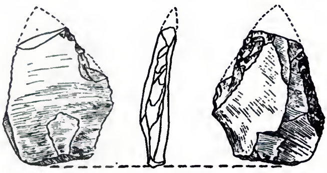

FIG. 16. Broken point of Mousterian type found 2.50 meters below the surface of Ovrashnaia Street, Samarkand. Scale ⅔. (*After* Grigor'ev, 1940: 89, fig. 29.)

has not been determined as yet with any degree of precision, the finds are important as indicative of the fact that during Late Pleistocene times the southern portion of the Turan Plains, as well as the Central Asiatic highlands, was occupied by men in a Mousterian stage of cultural development.

Aman-Kutan, south of Samarkand

In 1947 an expedition sent out by the State University of Uzbekistan under the leadership of D. N. Lev investigated the Cave of Aman-Kutan (also known as Bul-Bul Zarsa), which is located 43 km. (26.9 miles) south of the city of Samarkand, and 14.4 km. (9 miles) north of the town of Kitab in the drainage of the Kashka Darya (see fig. 2). As yet only two preliminary reports are available dealing with this interesting site (Lev, 1949*a*; 1949*b*),[14] situated at an altitude of approximately 1,300 meters (4,265 feet) above sea-level,[15] and just over a mile south of the main pass through the Takhta-Karacha Mountains. This cave opens on a small *sai* or gorge through which flows the Aman-Kutanka Darya, a tributary of the Kashka Darya. It is surrounded by limestone mountains that rise up to elevations of almost 2,000 meters (6,600 feet). During the spring this place is rather damp, and in May water actually flows out of it. Along the west wall there is standing water up to 10 cm. deep.

The entrance is 1.50 m. wide and 90 cm. high; inside a narrow passage 7.20 m. long opens onto the main chamber, which is 2.62 m. wide, 2.52 m. long and 1.60 m. high. The west wall of this chamber, as well as the western portion of the floor are covered with a stalagmitic bed. In a test trench in the western sector, a culture layer was uncovered at a depth of 75 cm. This yielded quantities of broken and split animal bones, charcoal fragments and ash, together with some chips of quartz. In the stalagmite bed a series of animal bones and a fragmentary human femur[16] were found, while stone artifacts occurred both in this horizon and in the upper 10 to 15 cm. of the underlying deposit. These were associated with traces of a hearth—charcoal fragments and stones blackened by smoke. In all a total of 443 animal bones and nine implements have been found thus far at the Cave of Aman-Kutan.[17]

None of the stone artifacts are of flint, which does not occur locally. All of the specimens are stated to be crude and of irregular shape. Lev considers that the rough and very primitive flakes were not struck from prepared cores, but were obtained by a very archaic technique which consisted of merely splitting up blocks of the raw material. But there does not seem to be any evidence to suggest that the actual knapping by this or any other method was done at the site. Two of the implements—a scraper and a leaf-shaped tool—are made on flakes of diorite exhibiting prominent bulbs of percussion and wide striking platforms. One of these is 4.5 cm. long and 2.7 cm. wide; the other is approximately 2 cm. long by 2 cm. wide. In association with the charcoal and smoke-blackened stones mentioned above, six massive, very crude and unretouched artifacts of both diorite and limestone came to light. Lev suggests that three of these resemble disc-shaped nuclei, but gives no further description of them. However, in his opinion, all of them were manufactured by a percussion technique more primitive than what he calls the Mousterian.[18]

The fauna from Aman-Kutan has very close affinities to that of Teshik-Tash. On the basis of

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[14] A somewhat more detailed and presumably adequately illustrated account of Aman-Kutan was also published by D. N. Lev in 1949 entitled "Drevnii Paleolit v Aman-Kutane (predvaritel'nee soobshchenie)"; (Lower Palaeolithic in Aman-Kutan. Preliminary Report). This appeared in *Trudy Uzbekskogo Gosudarstvennogo Universiteta im. Alishara Navoi.*, n.s., 39: 3–48, 1949, but this volume cannot be located anywhere in the U.S.A. For a very brief review of Lev's report, see G. A. Tsvetaeva in *Vestnik Drevnei Istorii*, 2: 162, 1951.

[15] The elevation of Aman-Kutan is given as 1,450 m. in Lev, 1949*a*, and as 1,300 m. in Lev, 1949*b*.

[16] This bone was sent to the Anthropological Institute in Moscow where it was examined by Professor M. M. Gremiatskii, whose comments are summarized by Lev (1949*b*: 67–68) as follows: This fragment of femur differs from that of modern man in (*a*) its long neck, (*b*) the low position of the greater trochanter, (*c*) the absence of a *crista hypotrochanterica*, and (*d*) the feebly developed *linea aspera* or absence of it. It is stated to differ from the corresponding bone of Neanderthal Man in respect of (*a*) the smaller size of the head (*ca.* 42 mm. by 53 mm. in diameter), (*b*) the slight expression of the lesser trochanter, and (*c*) the large collo-diaphysial angle (125°–130° instead of 116°). However, the index of platymeria (the width of the epiphyses is 110 mm.) and the size of the sagittal and transverse diameters of the bone (30 mm. and 39 mm., respectively) shows relationship to Neanderthal Man. As soon as this interesting bone has been more carefully cleaned from the stalagmite in which it was embedded, Lev states that it will be studied in detail by the Soviet palaeoanthropologists.

[17] According to Lev (1949*a*), Aman-Kutan yielded a total of 900 animal bones and 12 stone artifacts, but elsewhere the same writer (Lev, 1949*b*) gives these figures as 443 and 9, respectively.

[18] Not defined, but apparently Lev's reference is to the Teshik-Tash assemblage.

Gromova's preliminary identifications, the following are present: *Equus* sp., *Cervus* cf. *elaphus, Capra sibirica* (common), *Hyaena* (*Crocuta*) *spelaea* (?), *Ursus* cf. *arctos, Hystrix* sp., *Marmota* sp. and *Ochotona* sp. In addition there are possible remains of Fox and other small carnivores; one tooth presumably belongs to *Equus caballus.* On the basis of the evidence of the fauna, the main occupation of the prehistoric inhabitants of this cave was hunting the Siberian Mountain Goat, just as it was in the case of the Neanderthals of Teshik-Tash.

According to Lev, the typology of the archaeological material from Aman-Kutan suggests affinities with the assemblages from Drachenhöhle, Krapina, La Ferrassie (basal level), Taubach, Ehringsdorf, and Rabutz in Central and Western Europe, all of which are of Third Interglacial age, as Škerlj (1950*a*) points out. As far as the U.S.S.R. is concerned, Lev lists the lower horizon (Bonch-Osmolovskii's so-called "amorphous stage") of Kiik-Koba in the Crimea (Bonch-Osmolovskii, 1940; 1941), which is comparable in many respects with the Tayacian of Western Europe (Efimenko, 1938: 209). He refers to the Aman-Kutan industry as "Clacto-Pre-Mousterian" and assigns it to the end of the Mindel-Riss Interglacial. Although this dating is accepted by Hančar (1952: 70), who places Aman-Kutan in the Lower Palaeolithic, the evidence on which it is based is very difficult to understand. Certainly it is apparent from Gromova's list that the fauna from this site does not include a single typically Middle Pleistocene (i.e., Second Interglacial) form. Indeed, as in the case of Teshik-Tash (see p. 400), it is clearly an Upper Pleistocene assemblage with the Siberian Mountain Goat predominant. Accordingly, the present writer agrees with Škerlj (1950*b*: 66–67) in considering it very unlikely that this site can possibly be older than the Riss-Würm (Third) Interglacial in terms of the Alpine sequence, and it may conceivably be even younger.

Lev and Hančar, on the other hand, believe that this cave contains evidence for the earliest occupation thus far discovered in Uzbekistan. But this argument seems to be based entirely on typological considerations: Aman-Kutan must be "Pre-Mousterian," since the tools from the demonstrably Mousterian locality of Teshik-Tash are more perfected and developed. But to deduce age on the basis of cultural evidence and technique employed in the manufacture of tools in a relatively unknown region is extremely dangerous, especially as the primitive aspect of the Aman-Kutan artifacts is apparently due mainly to the poor quality of the available raw material (compare Petrbok, 1950). Therefore, until the final report on this site is available, the present writer feels that any expression of opinion would be premature, although it may well be that here we are dealing with a development comparable in certain respects with what is called Tayacian in Western Europe.

LATE UPPER PALAEOLITHIC OR EARLY MESOLITHIC (?)

The materials from one open-air station indicate that the plains of Central Asia were occupied during the closing stages of Late Glacial and the beginning or Early Post-Glacial time.

Komsomol Lake, near Samarkand

Very little has ever been published concerning the site on Komsomol Lake, 8 km. (5 miles) east of Samarkand. Okladnikov (1945) states that the flint blades from Airatama (see p. 402) recall those from Komsomol; according to his table 6 (Okladnikov, 1949*a*: 82), prismatic cores, retouched flake knives and some scrapers were also found at this locality. As in the case of Airatama, the series from Komsomol has been tentatively assigned to the Late Upper Paleolithic or the Early Mesolithic, but no evidence pertaining to either the stratigraphy or faunal associations (if any) has ever been published.[19] The location of Komsomol is shown on the map, fig. 2.

THE KRASNOVODSK REGION IN WESTERN TURKMENIA

Following each of the maxima of the North European glaciations, when the ice was retreating, the Caspian Sea became a greatly enlarged body of water and the drainage flowed westward through the Manych depression into the Black Sea via an outlet channel at an elevation of 25 meters (82.7 ft.), whereas the surface is now 26 meters (86 ft.) below sea-level (Berg, 1950: 113; Kropotkin and Bealby, 1910). According to Cressey (1951: 342), "surrounding the Caspian Sea is a desert of limited usability. Much of it is covered with Quaternary sand and clay laid down by the expanded sea and reworked by the wind." Whereas at present 70 per cent of the water that flows into this vast inland basin comes from the Volga and 19 per cent from direct precipitation, there is evidence that during Late Pleistocene times the now-dry Central Asiatic rivers were supplying a far greater share of the intake. For there are indications of a cooler climate and much increased rainfall in the Western Turkmenian Desert at that time (Fedorovich, 1940). The last transgression of the Caspian known as the Khvalyn, is generally correlated with the Würm Glaciation of the Alps (Mirchink, 1936: 33; Grahmann, 1937: 31; Berg, 1950: 115–116), but it is not likely that the waters of this inland sea began to recede from the level of the Khvalyn marine terraces (or raised beaches) until Early Post-Glacial times when the Volga drainage was completely free of the melt-water run-off from the last receding ice-sheets. Since two transgressions older than the Khvalyn (the Khazar and the Baku) are known, it is apparent that these ancient marine deposits will ultimately provide the key to tying in the Pleistocene sequence of the Caspian region with the Alpine glacial cycle.

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[19] In a brief paper Gromova (1946) has described a collection of animal bones (including teeth of *Equus Valeriani*, believed to be a new species of Horse). This material is stated to have been excavated in 1938 at an allegedly Upper Palaeolithic site by Voevodsky, but the name of the locality is not given.

The first Palaeolithic artifacts to be collected on the eastern shores of the Caspian were reported by V. V. Shumov and N. P. Luppov during a geological reconnaissance of the Krasnovodsk Peninsula. These finds were studied by P. I. Boriskovskii (1947), who came to the conclusion that, with the exception of the materials from three surface sites—described as of Mousterian type—the bulk of the collection broadly represented a Late Upper Palaeolithic/Early Mesolithic stage of development. However, later work by A. P. Okladnikov (1949*b*), who reinvestigated certain of the previously reported localities in the region of Soimonov Bay and discovered several new stations as well, has shown that since pot-sherds occur in direct association with the material in question, it should be referred to the Early Neolithic. Okladnikov likewise found several sites which he classified as Mousterian, in addition to one possible Upper Palaeolithic station. He also mentions a stratified cave locality where a Mesolithic horizon is overlain by the Anau Stage of the Neolithic of Central Asia. Each of the sites reported to date is described below.[20]

MOUSTERIAN SITES

As previously stated, the Mousterian is known from this region only on the basis of a series of surface finds, nothing *in situ* having been reported as yet. This is not considered to be definite proof that Western Turkmenia was occupied during Mousterian times, but merely as an indication that such was the case. No illustrations of any of the typologically Mousterian objects from the Krasnovodsk sites have been published.

Iangadzha

(For location see fig. 17)

Iangadzha is on the coast 30 km. (18.8 miles) due east of Krasnovodsk. A large flake with cortex on the upper surface, a triangular flake with lightly retouched edges, and three massive flakes with parallel facets on their upper surfaces from this place are considered by Boriskovskii (1947) as of Mousterian type and to have been manufactured by the Mousterian flaking technique.

Takyrnaia Ravine

(Location not given)

From this station Boriskovskii (1947) describes a flake implement with coarse well-defined retouch on both edges, and two implements of triangular outline that resemble Mousterian points.

Kyir

(For location see fig. 17)

This site is near a well 14.5 km. (approximately 9 miles) northeast of Kuuli. According to Boriskovskii (1947), only one artifact was found at this site. It is a massive flake of flint slightly retouched and recalling a Mousterian scraper.

Well of Kaskyr-Bulak

(For location see fig. 17)

This station, which is situated 23 km. (14.4 miles) north-northeast of Krasnovodsk, was investigated by Okladnikov in 1947, who states that he found two points of classic Mousterian type there (Okladnikov, 1949*b*).

41 Kilometers from Krasnovodsk on the Road to Askhabad

(For location see fig. 17)

Here Okladnikov (1949*b*) found "archaic stone implements," including large crude flakes and

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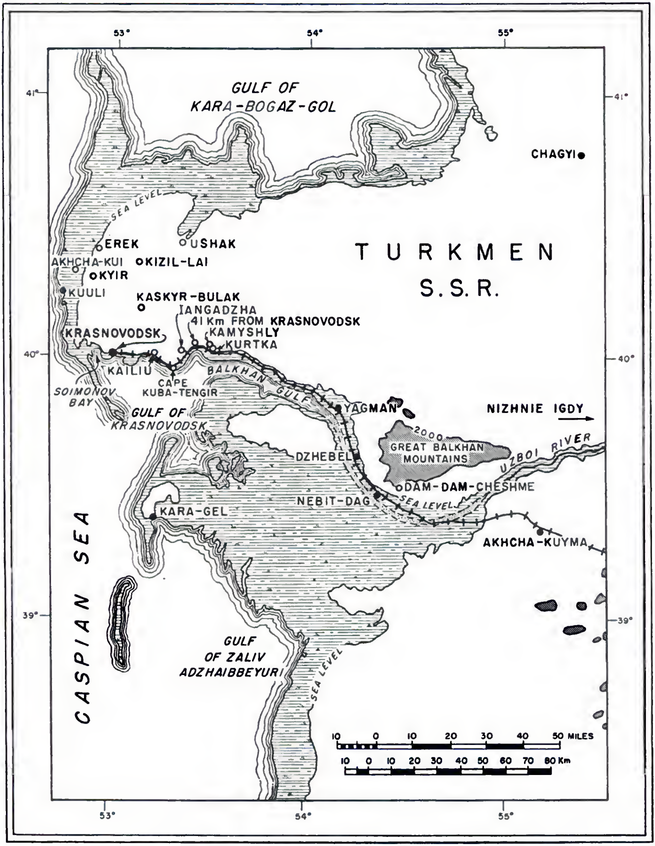
[20] For their invaluable assistance in locating many of these sites and in the preparation of the accompanying map (fig. 12), the writer is deeply grateful to Donald H. Hunt and Theodore Shabad of the staff of the Air Research Division of the Library of Congress.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41°
40°
39°
GULF OF KARA-BOGAZ-GOL
CHAGYI
SEA LEVEL
EREK
USHAK
AKHCHA-KUI
KIZIL-LAI
KYIR
KUULI
KASKYR-BULAK
IANGADZHA
41 Km FROM KRASNOVODSK
KAMYSHLY
KURTKA
KRASNOVODSK
TURKMEN S.S.R.
KAILIU
CAPE KUBA-TENGIR
BALKHAN GULF
SOIMONOV BAY
GULF OF KRASNOVODSK
YAGMAN
NIZHNIE IGDY
2000
GREAT BALKHAN MOUNTAINS
UZBOI RIVER
DZHEBEL
DAM-DAM-CHESHME
NEBIT-DAG
SEA LEVEL
KARA-GEL
AKHCHA-KUYMA
CASPIAN SEA
GULF OF ZALIV ADZHAIBBEYURI
SEA LEVEL
10 0 10 20 30 40 50 MILES
10 0 10 20 30 40 50 60 70 80 Km

FIG. 17. Western Turkmenia showing locations of sites on the Krasnovodsk Peninsula and adjacent areas. (The contour lines express elevations in feet.)

discoidal nuclei, which he has tentatively assigned to the Mousterian.[21]

These finds suggest that this region was inhabited during Mousterian times, and possibly earlier. Certainly when intensive field-work can be done here, it will be interesting to determine the relationship of these early assemblages to the ancient marine terraces of the Caspian. The establishment of such a chronology will ultimately provide the basic dating evidence for relating the Mousterian and even older materials in Central Asia to the glacial cycle of the Pleistocene, thereby providing firm chronologic grounds for comparing Palaeolithic developments in this remote area with comparable events in Western and Central Europe.

UPPER PALAEOLITHIC (?)

As in the case of the Mousterian finds, no Upper Palaeolithic artifacts have ever been found *in situ* in the region under consideration. The following surface site of the road from Krasnovodsk to Askhabad is tentatively considered by Okladnikov (1949*b*) to be possibly Upper Palaeolithic.

Well of Kurtka

(See fig. 17 for location)

At this site 2 miles northwest of the Kara-Tengir railroad station Okladnikov (1949*b*) found several large nuclei of flint from which big broad blades had been detached, and he clearly states that these blades are not as regular in shape as are the small narrow ones of later periods (see below). Also present in the Well of Kurtka assemblage is a series of flint scrapers of "archaic" type, which are considered to represent an older stage than the examples found in association with later Mesolithic assemblages. In any case, the evidence from this site can scarcely be taken as demonstrating the presence of an Upper Palaeolithic blade complex in Western Turkmenia, especially as geologic and paleontologic associations are totally lacking and the material in question was found on the surface.

MESOLITHIC

The existence of a definitely pre-ceramic Mesolithic stage in Central Asia has been demonstrated at a stratified cave site, the final report on which has not yet appeared.

Dam-Dam-Cheshme

(For location see fig. 17)

This very important cave site, which is situated on the southern slopes of the Great Balkan Mountains, 7 km. (4.4 miles) east-northeast of Nebit-Dagh, was originally investigated by V. V. Shumov in 1943. The upper layer is definitely Neolithic.[22] In addition to typical Anau-type leaf-shaped arrowheads, it yielded fragments of dark grey pottery that Okladnikov (1949*b*) states is like the ware from Ak-Tepe, near Askhabad, as well as other localities in Iran (Tepe Hissar, Shah Tepe, etc.) and Anatolia (Troy, Alaça Hoyuk, Alishar, etc.).

At an unspecified depth below this Neolithic horizon in the eastern half of the cave an extensive hearth was found, associated with which a large assortment of flint implements came to light. No pottery or arrowheads were found in this horizon. With the exception of one small conical nucleus (fig. 19, no. 1) published by Boriskovskii (1947), no illustrations of any of this material have yet appeared. The Mesolithic assemblage from the Cave of Dam-Dam-Cheshme, given by Okladnikov (1949b), includes the following: many flakes and knife-like blades of flint; prismatic nuclei of symmetrical outline; nucleiform implements of more or less conical shape (fig. 19, no. 1); small pointed blades with steeply retouched backs; a series of very well-made points or perforators; end-of-blade scrapers; and miniature discoidal scrapers. Of special interest Okladnikov mentions the occurrence of several large lunates or crescents made from segments of flint blades and worked with characteristic steep retouch along the convex edge. Judging by the large size of these crescents, the presence of small nucleiform tools and the absence of typically geometric forms (e.g., triangles, trapezoids, etc.), Okladnikov tentatively assigns this horizon at Dam-Dam-Cheshme to a fairly early stage of the Mesolithic, corresponding in a time sense with the Azilian of Western Europe and the southern portion of the U.S.S.R. To the present writer such an early dating seems very unlikely, especially in view of the presence of Late Neolithic/Early Bronze Age pottery in the immediately overlying layer, but until the final excavation report on this important locality is available, it is impossible to be more specific.

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[21] Presumably this site is near the locality briefly referred to in the January 1950 issue of the *Eastern World* (4 (1): 20) under the heading: "Palaeolithic Remains found in Central Asia by U.S.S.R. Expedition." The first paragraph of this short article is as follows:

"The work of the South-Turkmenian Joint Expedition, which is conducting archaeological researches in the Western Kara-Kum, on the banks of the River Amu-Darya and in the district of Askhabad, has been completed. The expedition collected very valuable relics of the culture of Central Asia in the most ancient times. Twenty-five miles (40 km.) east of Krasnovodsk stone weapons of the hand-axe type, one of the Acheulian Period, others of the post-Acheulian, were found."

[22] Early Bronze Age (*ca.* 3000–2500 B.C.) in terms of Mesopotamian chronology.

EARLY NEOLITHIC

As stated above, the materials from six localities in the Krasnovodsk region were originally described by Boriskovskii in 1947 as of Late Upper Palaeolithic or Early Mesolithic age, but at the same time he pointed out that, since the entire series had been collected on the surface in blowouts, and nothing even remotely approaching stratigraphy had been reported, this conclusion should be regarded as tentative. Apparently he considered the pot-sherds collected by Shumov and Luppov at some of these stations as belonging to a later occupation; in any case, he did not describe them, although their presence in certain instances is mentioned. In order to establish the age of this material more precisely, he stated that further field-work would be necessary, and in 1947 this project was carried out by Okladnikov (1949*b*). The evidence at the most important of these sites —Kizil-Lai—will be considered first.

Kizil-Lai

(For location see fig. 17)

Kizil-Lai is actually an area the center of which lies 19 km. (12 miles) north of Kaskyr-Bulak; the name means Red Mud or Clay in Turkmen. Together with the artifacts collected on the surface at this locality, Boriskovskii (1947) states that a jaw fragment of *Bos primigenius* was found. The stone implements are all made of flint which occurs locally in the form of river pebbles; the series is comprised of the following: four obliquely truncated points (fig. 18, nos. 1 and 2); five small and relatively narrow backed blades (fig. 18, nos. 3–6); five ordinary blades with retouched edges (fig. 18, no. 7); a series of nondescript flakes and chips; eighteen end-scrapers, many of which are made on short sections of blades of flakes (fig. 18, nos. 8–15), including two double-ended forms; four perforators made on thin blade fragments (fig. 18, nos. 16 and 17); seven prismatic nuclei of very regular outline (fig. 18, nos. 18, 19 and 20). Associated with the latter, all of which are less than 4 cm. long, approximately a hundred micro-blades (*lamelles*) of very thin section and regular parallel edges are reported. In addition, a series of ordinary prismatic blade cores was found, some of which show evidence of use as steep scrapers or planes along one edge of the platform. Boriskovskii considered that the fact that this site occurred above the level of the Khvalyn marine terrace of the Caspian was of fundamental importance in supporting his argument for an early dating of the Kizil-Lai material, at least until the stratigraphic sequence of the region should be better known.

In 1947 Okladnikov visited Kizil-Lai and conducted careful investigations there. He ascertained that stone artifacts of the same type as those reported by Boriskovskii occurred *in situ* to a depth of approximately half a meter below the surface. and not merely as surface finds in windblown spots. At a depth of 40 cm., he discovered two sherds of very crude black pottery, unlike any of the coarse wares of the Anau I assemblage. Since these sherds were associated with the same micro-blade industry found in the surface layer. Okladnikov (1949*b*) concluded that the Kizil-Lai assemblage should be assigned to an early stage of the Neolithic, notwithstanding the fact that it presents certain typologic analogies (e.g., backed blades, symmetrical nuclei of prismatic shape, etc.) with the materials from the demonstrably Mesolithic horizon at the Cave of Dam-Dam-Cheshme. This conclusion is further confirmed by the evidence obtained at the Cape Kuba-Tengir locality, described below.

Cape Kuba-Tengir

(For location see fig. 17)

This site, situated on a coastal promontory some 28 km. (17.5 miles) east of Krasnovodsk, is apparently a workshop where shell beads were manufactured during Early Neolithic times (Okladnikov, 1949*b*; Kaposhina, 1948). On this isolated rocky cape Okladnikov found a depression, completely filled with sandy soil rich in cultural material, at an unspecified height above the Caspian. The majority of the finds consist of oval beads made from sea shells (*Didachna* sp.), many of which were perforated at one end with a biconical hole. Partially completed examples representing all stages of manufacture were also found, together with a series of thick whitish-colored beads of more rounded shape and with a hole in the middle.

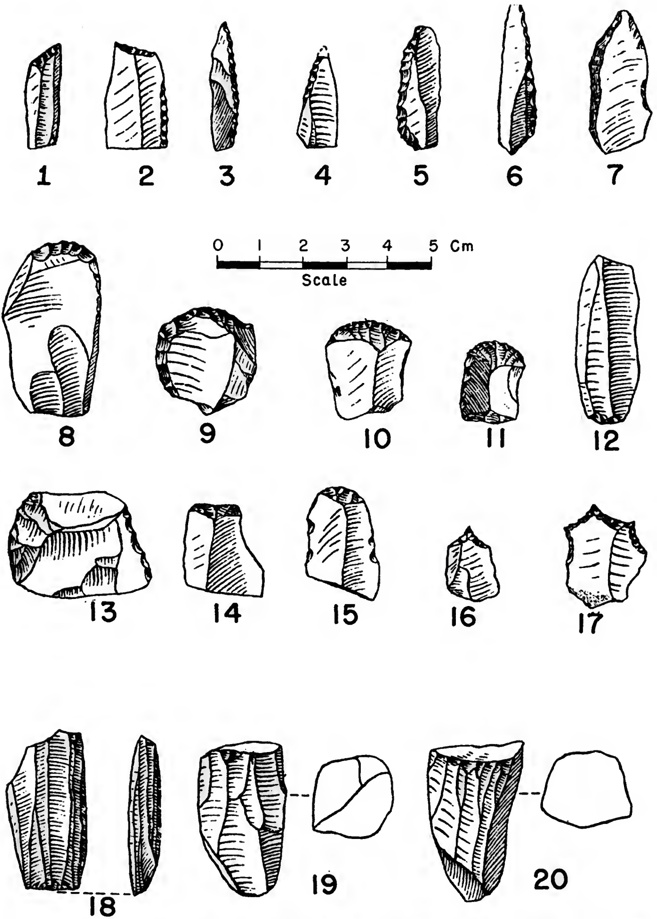
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FIG. 18. Early Neolithic flint artifacts from the Kizil-Lai area approximately 40 km. (25 miles) NNE of Krasnovodsk. (*After* Boriskovskii, 1947, fig. 1.)

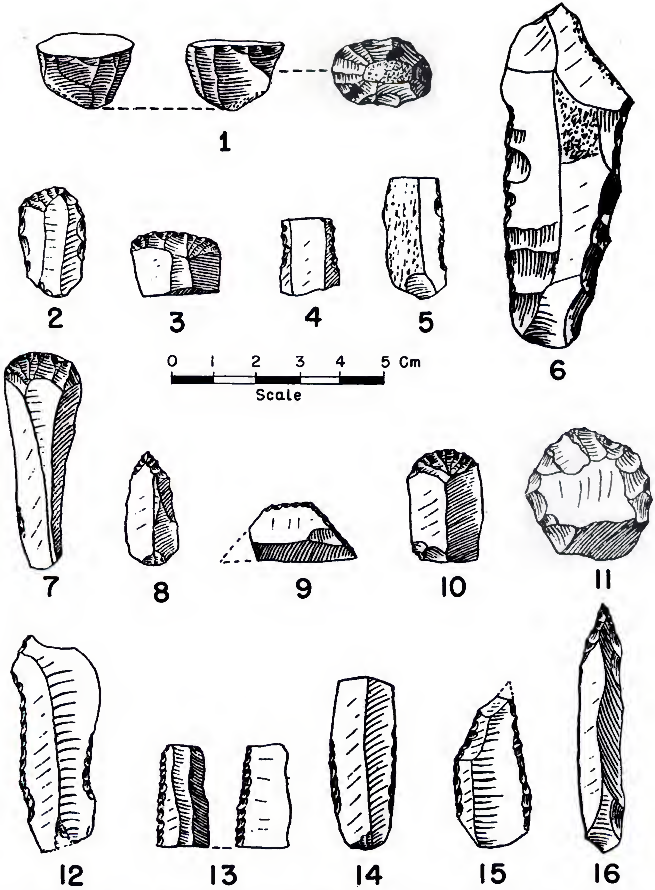

FIG. 19. Mesolithic and Early Neolithic flint artifacts from various sites in Western Turkmenia. No. 1: Dam-Dam-Cheshme, a cave 7 km. (4.4 miles) ENE of Nebit-Dag; nos. 2-5: Erek, a locality 24 km. (15 miles) NNE of Kuuli; nos. 6 and 8-11: Kaskyr-Bulak, a site 23 km. (14.4 miles) NNE of Krasnovodsk; nos. 7, 12 and 13: Kamyshly, situated 43 km. (26.9 miles) E of Krasnovodsk; and nos. 14-16: Nizhnie Igdy on the Uzboi River 332 km. (207 miles) due E of Krasnovodsk. (*After* Boriskovskii, 1947, fig. 2.)

According to Okladnikov (1949*b*: 69), the latter type of bead is of frequent occurrence at the Mariupol cemetery in South Russia (compare Makarenko, 1933), which is of Neolithic age. The sandy deposits at the Cape Kuba-Tengir locality were of a more or less ochreous color, and many of the beads exhibited a deep red staining.

Stone implements were numerous and consisted mainly of a great quantity of broken points with blunted backs made on small blades. Apparently these are very similar to examples from Kizil-Lai (compare fig. 18, nos. 3–6). As Okladnikov point out (1949*b*: 70), the fact that small points with blunted backs are so common at this site indicates that they were the principal tools used in the manufacture of the shell beads. A series of various types of scrapers, several nuclei, a few small unretouched blades and some trimming flakes completes the inventory of the stone artifacts from Kuba-Tengir. Since nothing was found to indicate that this place had served as an actual occupation site, Okladnikov considers it a workshop where marine shell beads were produced. This, he states, suggests a stage of industrial specialization in the production of ornaments that probably indicates trade relations over a fairly wide area, and hence populations organized on a wider basis than the local clan. As at Kizil-Lai several small sherds of coarse black pottery were found at Cape Kuba-Tengir. The direct association of pottery with stone implements of Mesolithic type at these two sites is considered by Okladnikov to demonstrate that they are both older than Anau I. He concludes by stating that this coarse black ware is probably the oldest pottery thus far discovered in Central Asia, and on this basis assigns the sites in question to the Early Neolithic.

Miscellaneous Sites

In addition to Kizil-Lai, Boriskovskii (1947) has described stone artifacts from the following five surface stations in the Krasnovodsk region and along the road between Krasnovodsk and Askhabad: Erek, Kaskyr-Bulak,[23] Kamyshly, Akhcha-Kui, and Nizhnie Igdy on the right bank of the Uzboi River. The location of each is indicated on the map, figure 17. At Erek (fig. 19, nos. 2–5) a series of micro-blades up to 3 cm. long was associated with several broken blades retouched along either one or both edges, and two end-scrapers made on short blade sections. The Kaskyr-Bulak assemblage (fig. 19, nos. 6 and 8–11) includes a series of small blades, some flakes, two end-scrapers made on short segments of blades, a rounded scraper 3 cm. in diameter, a large blade "with retouch of Neolithic aspect," and a large trapezoid (1.2 × 3 cm.) one end of which is broken (fig. 19, no. 9). Kamyshly (fig. 19, nos. 7, 12, and 13) yielded a score of flakes and small blades of very regular outline, a large prismatic nucleus, two end-of-blade scrapers, two blades with carefully retouched edges, and an atypical graver-like tool. In addition to a few lightly retouched micro-blades from Akhcha-Kui, a well situated 10.5 km. (6.6 miles) northeast of Kuuli, there is a burin on the angle of a broken blade and a carefully retouched point. At Nizhnie Igdy 332 km. (207 miles) due east of Krasnovodsk, there was collected a series of small blades with retouch on the edges (fig. 19, no. 14), a median perforator on a thick elongated blade (fig. 19, no. 16), and a small triangular point with a broken tip (fig. 19, no. 15). Boriskovskii (1947) concludes by stating that, in addition to the sites enumerated above, he knows of other surface stations in Western Turkmenia each of which has yielded a few flint implements, including several end-scrapers and one or two small retouched blades. Evidently this region was fairly densely inhabited during Late Mesolithic/Early Neolithic times. For, on the basis of the evidence from the Cave of Dam-Dam-Cheshme, summarized above, it is extremely unlikely that all of these stations are to be assigned to the Early Neolithic along with Kizil-Lai and the Cape Kuba-Tengir locality. Presumably further research will show that at least some of them are Mesolithic, but certainly there is no evidence whatsoever to support an Upper Palaeolithic dating, as originally proposed by Boriskovskii. Indeed even Okladnikov's site at the Well of Kurtka (see p. 409) can only be tentatively considered as possibly Upper Palaeolithic; on a typological basis, it is not Mousterian, on the one hand, nor is the assemblage like the Mesolithic from the lower horizon at the Cave of Dam-Dam-Cheshme, on the other. As in the case of the sporadic finds of Mousterian artifacts in this region, there is no stratigraphic evidence as yet to demonstrate a Late Pleistocene antiquity for this locality. Further intensive work in this interesting and important region is urgently needed.

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[23] As stated on page 407, Okladnikov (1949*b*) has reported finding two points of classic Mousterian type at this locality.

TABLE 4

TENTATIVE CHRONOLOGY OF STONE AGE SITES IN SOVIET CENTRAL ASIA

Tentative correlation	Stage of cultural development		Southern Uzbekistan		Western Turkmenia	
			Baisun region	Samarkand region	Krasnovodsk Peninsula	
Post-Glacial	Neolithic	Late	Amir-Temir (Upper Level) Katta-Kurgan (Upper portion of Upper Level)	Kel'Teminar Culture (Khorezm) Anau I Culture (Southern Turkmenia)	Dam-Dam-Cheshme (Upper Level) Kailu Station Cave near Dzhebel Well of Ushak	
ca. 4000 B.C.		Early	———	———	Kizil-Lai Cape Kuba-Tengir	*Surface Sites:* Erek Kaskyr-Bulak Kamyshly Akhcha-Kui Nizhnie Igdy
ca. 6000 B.C.	Mesolithic		Katta-Kurgan (Basal portion of Upper Level) Temir-Ul'de (?) Zarangat-Gut (?) Dukan-Khan (?)	———	Dam-Dam-Cheshme (Lower Level)	
? Late Upper Palaeolithic or Early Mesolithic			Airatama (Surface Site)	Komsomol Lake (Surface Site)	Well of Kurtka (Surface Site)	
Fourth Glaciation (Würm)	Full Upper Palaeolithic		———	———	———	
Probably Third Interglacial (Riss-Würm)	Mousterian		Teshik-Tash Amir-Temir (Lower Level) Katta-Kurgan (Lower Level) Kurgan-Dar'ia (?)	Ovrashnaia Street (City of Samarkand)	Iangadzha Takyrnaia Ravine Kyir Kaskyr-Bulak 41 km. E. of Krasnovodak (? Mousterian of Acheulian Tradition)	*Surface Sites*
	? Tayacian		———	Aman-Kutan (near Kitab)	———	

SUMMARY AND CONCLUSIONS

The archaeological horizons at the various sites in the three regions of Central Asia discussed in this paper are arranged chronologically on the accompanying table. Typologically the oldest assemblage appears to be that of Aman-Kutan, but further work may demonstrate that this locality is actually not very much older than Teshik-Tash; certainly it is extremely unlikely that it dates from Second Interglacial times, as claimed by the Russians (see p. 400). Possibly the Aman-Kutan artifacts, of which only nine (? or twelve) have been found thus far, are comparable with the Tayacian in Western Europe, but until the final excavation report is available, it is impossible to be more explicit. In any case, the so-called "Tayacian" also occurs at the Mugharet-et-Tabūn in Palestine (Garrod and Bate, 1937: 89–90) and at Kiik-Koba in the Crimea (Bonch-Osmolovskii, 1940; 1941). As the Aman-Kutan excavations progress, it will be interesting to see whether additional human bones come to light. As stated on page 405, a fragment of the proximal end of a human femur was found during the course of the first season's work.

In addition to the well-known Cave of Teshik-Tash, the existence of the Mousterian has been demonstrated at three sites in the Baisun and Samarkand regions of Southern Uzbekistan. Furthermore, at five surface stations on the Krasnovodsk Peninsula in Western Turkmenia, artifacts that are typologically Mousterian have been reported. But to date nothing *in situ* has been discovered, and hence this evidence cannot be accepted as definite proof that this section of Central Asia was occupied during Mousterian times. For in Central Siberia, Trans-Baikalia, and the Ordos region of North China it has been established that crude tools of Mousterian type are very characteristic of the Upper Palaeolithic assemblages of those areas.

In the Middle East true Middle Palaeolithic levels have been found at the Cave of Hazar Merd, near Sulaimaniya in Southern Kurdistan (Garrod, 1930: 13–22), Shanidar Cave in the Rowanduz District of Northeastern Iraq (Solecki, 1952), and from several localities in Iran (Coon, 1951), the most important of which is a cave near Bisitun, between Hamadan and Kermanshah. Other sites that have yielded comparable materials, in which the Levalloisian or prepared striking-platform/tortoise core technique is always predominant, are found in Palestine, Syria and the Lebanon (Garrod, 1928; 1942, with Bate, 1937; Turville-Petre, 1927; Neuville, 1934; 1951; Ewing, 1947; Rust, 1950). It is an interesting fact that, although the principal method employed in flake production at these localities does not correspond with the characteristic Mousterian discoidal core technique found at the Mousterian stations of Central Asia, nevertheless the form of the finished artifacts is remarkably uniform for the most part. Although it is by no means typical, the prepared striking-platform/tortoise core technique is present at Teshik-Tash in Southeastern Uzbekistan, as stated on page 396. Core implements, including crude hand-axe type tools, choppers and chopping-tools, occur in small numbers at the latter site, as well as at Amir-Temir, indicating the persistence here of an older tradition which apparently had died out in the Middle East by the Late Acheulian stage of development. In this connection, the publication of the report on the hand-axe locality 25 miles east of Kresnovodsk on the road to Askhabad (see footnote 21) is awaited with special interest.[24]

The limace, or slug-shaped flint implement of classic Western European form, which occurs at Teshik-Tash, is comparatively rare in the Levalloiso-Mousterian assemblages of the Near East. These tools are present in small numbers at Bisitun in the Zagros Mountains of Western Iran (Coon, 1951: 65 and 91, pl. III, nos. 6–7), but elsewhere in this region their occurrence seems to be rather sporadic. In a broad sense, however, it may be concluded that the artifactual materials produced by the Siberian Mountain Goat hunting peoples of Central Asia was on the whole surprisingly reminiscent of those of contemporary populations in Southwestern Asia. On the other hand, affinities with the classic Mousterian assemblages of Western Europe (compare Bordes, 1951; with Bourgon, 1951) cannot be denied. And as Okladnikov (1949*a*: 81) himself points out, the resemblances with the Mousterian sites of the South Russian Plain (Efimenko, 1935; 1938: 253–255), the Crimea (Bonch-Osmolovskii, 1930; Ernst, 1935; Zabnin, 1928), the Caucasus (Efimenko and Beregovia, 1941: 259; Gorodtsov, 1941; Zamiatnin, 1929; 1935*a*; 1940), and Armenia (Sardarian, 1950; Panichkina, 1950: 69–89; Hančar, 1952: 57–58), as well as those in the still more westerly regions of the U.S.S.R., are very striking. Thus it is quite apparent that the Mousterian of Central Asia is closely linked with contemporary developments of the same cultural tradition in other parts of Eurasia.

At the sites thus far reported in Russian Turkestan the absence of a true Upper Palaeolithic blade-burin complex is difficult to understand, especially in view of the wealth of Upper Palaeolithic materials from Central Siberia, the South Russian Plain, the Crimea, the Caucasus, and various sections of the Middle East, especially along the East Mediterrianean littoral. But the salient fact remains that in Central Asia no actual Upper Palaeolithic levels have been found as yet. The assemblages from three surface sites—Airatama in Southeastern Uzbekistan, Komsomol Lake east of Samarkand, and the Well of Kurtka on the Krasnovodsk Peninsula—have been tentatively assigned to the very end of the Upper Palaeolithic or the beginning of the Mesolithic. But there is neither stratigraphy nor geologic or palaeontologic associations at any of these stations, and the assessment is based entirely on typologic considerations. For in each case the small series reported consists of rather large blade tools and prismatic blade cores that appear to be cruder and, in one instance, more heavily patinated than is typical of the various Mesolithic series from the region as a whole. This very meager evidence cannot be accepted as demonstrating that Central Asia was occupied, as it presumably was, during Upper Palaeolithic times. Indeed the completely negative character of the information relative to the existence of an Upper Palaeolithic development in this region which has been obtained to date is very difficult to understand, both in view of the number of sites investigated as well as Garrod's (1936: 169–170; 1938: 20; compare Childe, 1950: 17; Hawkes, 1940: 28; Oakley, 1950: 56) postulated Iranian Plateau center for the development of the Aurignacian.

Turning now to the sites assigned to the Mesolithic in the Baisun region, the basal portion of the upper level at the Cave of Katta-Kurgan has yielded only chipped stone tools, consisting of blade implements and prismatic cores. As in the surface layer at Amir-Temir, pottery was present in the upper portion of this horizon, together with arrowheads and remains of cultivated cereals. At three other sites—Zarangat-Gut, Dukan-Khan and Temir-Ul'de—the existence of a pre-ceramic horizon was indicated in test-pits. Okladnikov considers that possibly evidence of occupation during Mesolithic times will be demonstrated when more extensive excavations are undertaken at these localities. To date no sites referable to this stage have been reported in the Samarkand region.

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[24] Presumably the material from this locality should be described as Mousterian of Acheulian tradition and compared with the series from Barda Balka, near Chemchemal in Southern Kurdistan (al-Asil, 1949; Howe and Wright, 1951; Wright, 1952).

In Western Turkmenia the important stratified Cave of Dam-Dam-Cheshme, situated on the southern slopes of the Great Balkhan Mountains, is the only locality where a demonstrably Mesolithic horizon has been discovered. The very preliminary reports that are available state that the upper level is Full Neolithic, contemporary with Ak-Tepe, Anau, Tepe Hissar, etc., but that the lower layer is definitely pre-ceramic and accordingly it is assigned to the Mesolithic. As characteristic features of the stone industry from this horizon, the following may be listed: small-to-medium-sized blades and blade implements, prismatic nuclei of symmetrical outline, small conical nuclei, small backed blades, and large lunates or crescents. Triangles, trapezoids and other geometric forms are absent. As yet nothing has been published concerning the fauna from this interesting locality, the final report on which is eagerly awaited.

A small series of surface sites on the immediately adjacent Krasnovodsk Peninsula were originally considered to be Late Upper Palaeolithic or Early Mesolithic, but subsequent investigations have clearly demonstrated the existence of pottery in two instances proving that they are later. In several fundamental respects the stone industry recalls the assemblage from the lower level at Dam-Dam-Cheshme; for the same small prismatic nuclei of very symmetrical outline occur, together with a large series of small, thin, parallel-sided microblades (*lamelles*), and small points with blunted backs. One site has yielded a large trapezoid, but the crescents or lunates of the lower level at Dam-Dam-Cheshme are absent. The following critical facts establish the Early Neolithic affinities of two of these stations: (*a*) at Kizil-Lai (see p. 410) sherds of crude black pottery, stated to be unlike any of the coarse wares of Anau I, were found at a depth of 40 cm. in direct and undisputed association with typical flint artifacts; and (*b*) at the site on Cape Kuba-Tengir (see p. 413) a very similar assemblage of stone tools was recovered, together with sherds of coarse black ware and a large series of beads, including types common at the Neolithic cemetery of Mariupol in Southern Russia. Now essentially this same stone industry has been reported from five surface sites in Western Turkmenia, as discussed on page 413, but without associated pottery. For this reason these localities are shown on the chart (table 4) as Late Mesolithic/Early Neolithic, since in each instance the assemblages in question also present rather close analogies with the series contained in the demonstrably Mesolithic horizon at the Cave of Dam-Dam-Cheshme, at least from a typologic point of view. That this region was occupied during Late Mesolithic times is demonstrated by the evidence of the following localities: Kailu Station, a cave near Dzhebel, and the Well of Ushak, all of which are assigned by Okladnikov (1949*b*) to the Anau I Stage of Turkmenia. However, the upper level of the Cave of Dam-Dam-Cheshme, which has yielded dark-faced burnished ware, is probably somewhat later, contemporary with what is already the Early Bronze Age in Mesopotamia.

Concerning possible Middle Eastern analogies for the Mesolithic and Early Neolithic assemblages from Western Turkmenia, one finds that a sequence, which is comparable in certain respects, has been established in the Kirkuk-Sulaimanyah region of Eastern Iraq as the result of excavations conducted by Garrod (1930: 13–23) at the Cave of Zarzi, and by Howe and the Braidwoods at the Cave of Palegawra, the large open-air site of Karim-Shahir, and the very Early Neolithic village of Jarmo (Braidwood, R. J., 1951*a*; 1951*b*; 1951*c*; with Braidwood, L., 1950; Braidwood, L., 1951). The Zarzi materials, which Garrod (1937: 37; 1938: 23) considers as representing a relatively late Gravettian development, include backed points and blades, shouldered points (rare), notched blades, small core scrapers, various other types of scrapers, numerous burins, micro-burins, and true microliths.[25] However, on the basis of the available data it is not possible to determine whether this industry actually belongs to the very end of the Upper Palaeolithic or to the beginning of the Mesolithic. In any case, what strikes one immediately on examining the series from Zarzi, as well as that from the nearby Cave of Palegawra —which is very slightly more developed than Zarzi from a typological point of view—is the neatness and fineness of the workmanship. Indeed, the small- to medium-sized flint implements from these sites have been produced by knappers in the best Upper Palaeolithic tradition of blade production. It is quite apparent that they belong to an older complex than is represented in the lower level at the Cave of Dam-Dam-Cheshme.

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[25] As Garrod (1936: 164: 1938: 14) points out, the microlith forms and small Azilian-like round scrapers from Zarzi resemble those from the Cave of Gvardzhilas Klde in the Caucasus (Krukovsky, 1916; Efimenko, 1934: 493; Golomshtok, 1938: 422–424; Zamiatnin, 1935*b*: 118 and fig. 4), a site that also dates from the very end of the Palaeolithic or the beginning of Mesolithic times.

Next in the sequence comes the Karim-Shahir industry, which Howe regards as a development from the Zarzi-Palegawra stage, but definitely later in time as evidenced by the presence of chipped and polished axes. In addition, there are a few backed blades, occasional burins, as well as many notched flakes and blades—all reminiscent of the earlier tradition. But there are no geometric microliths, although a micro-blade (*lamelle*) technique is in strong evidence. A small series of double-backed, needle-like drills constitute a distinctive feature of the series from Karim-Shahir. However, as compared with the Zarzi-Palegawra assemblages, the technique of manufacture displayed by the definitely Mesolithic materials from Karim-Shahir is on the whole far less controlled and purposeful, resulting in the production of flakes and blades that are less consistent as to form. In this respect both Karim-Shahir in Eastern Iraq, on the one hand, and the lower level at Dam-Dam-Cheshme in Western Turkestan, on the other, recall the industry which Coon (1952*a*; 1952*b*) has recently described from the interesting sequence of pre-Neolithic sands and gravels at the Hotu Cave, near Behshahr in Northern Iran. But just how the Hotu series, which thus far has only been very briefly mentioned in a preliminary report on the first season's work at the site, fits in with that from the nearby Belt Cave (Coon, 1951: 69–76) from a stratigraphic point of view is not as yet clear. It is quite apparent, however, that in the demonstrably Mesolithic horizon at this latter locality the same rather amorphous flint industry occurs, which is so marked a feature of the Hotu assemblage. At both sites there are also backed blades, although only one was found at Hotu where there are actually very few finished artifacts. At the Belt site, on the other hand, there are lunates, smaller but none-the-less reminiscent of Dam-Dam-Cheshme (lower level), together with a series of geometric forms—rather rough triangles, trapezes, asymmetrical, concave-sided trapezoids, and points with asymmetrical concave bases (Coon, 1951: pl. VIII, nos. 15–30), for which there are no parallels to date in either Western Turkestan or Eastern Iraq. And it is patently clear that the Belt Cave Mesolithic has nothing in common with the Natufian of Palestine, the Lebanon, Syria and Lower Egypt. Indeed, as Dr. Coon (1952*b*: 246) has remarked with reference to the results of his Hotu Cave excavations: "how to fit all this into a coherent . . . picture is beyond my capacity." But a second season's work at the Hotu locality will doubtless resolve many important and fundamental problems. In the meantime, for comparative purposes it will be very useful to have the final Russian report on the stratigraphy, fauna, and artifacts from the Cave of Dam-Dam-Cheshme as soon as it appears.

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THE MYCENAE TABLETS

A Transcription by

EMMETT L. BENNETT, JR.
Department of Classics, Yale University

With an Introduction by

ALAN J. B. WACE
Professor Emeritus of Classical Archaeology, Cambridge University

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PREFACE

THE fortunate discovery of inscribed clay tablets at Mycenae has significance beyond the addition of thirty-eight new documents to the corpus of Minoan Linear B inscriptions. This discovery makes it plain that the corpus will continue to grow, that the written documents of the Mycenaean civilization may be found not merely in the central palaces, but also among the peripheral private houses and shops, and that even where the citadel has been barren of records we may confidently expect further discoveries.

Significant clues to the decipherment or interpretation of our unknown script are hardly to be expected within the text of thirty-eight tablets or fragments of tablets. Yet one of these tablets does yield the missing evidence for the relationships of one set of ideographic signs. Perhaps there is as much worth hidden in the still undeciphered sign-groups.

I am deeply grateful to Professor Wace for the great privilege of transcribing and publishing the Mycenae tablets, and for many helpful suggestions. Grateful acknowledgment is also offered to Miss Alison Frantz, who has provided the excellent photographs of the tablets; to Miss Margaret Dow, who has drawn the sketch on the reverse of the tablet Oe 106; to Mr. David Smollett and Mr. Bernard Kreeger, who drew the map and plans of the House of the Oil Merchant; to Mr. Michael Ventris for suggestions and notes on the readings of the tablets; to those institutions named by Professor Wace who have made possible the discovery of the Mycenae tablets; and especially to Miss Margaret Dow, who was in charge of the excavation of the House of the Oil Merchant. My best thanks are also due to the American Philosophical Society, which in addition to the research grant made for the excavations has now undertaken the prompt publication of this new material from Mycenae.

INTRODUCTION

The British excavations at Mycenae in 1952 were conducted with a research grant from the American Philosophical Society assisted by contributions from the Universities of Cambridge and Oxford, the British Academy, the Leverhulme Trustees, and the British School at Athens under whose aegis the excavations were carried out. One of the principal objectives was the

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clearing of the House of the Oil Merchant (formerly called the House of the Stirrup Jars) which had been discovered in 1950.[1] This house lies outside the Acropolis and close to the east side of the carriage road immediately to the south of the tholos tomb known to archaeologists as "The Tomb of Clytemnestra" (pl. 9, 1).

Of the house which stood on a terraced slope little more than the basement survives (pl. 11, 3). This stands on a terrace wall of Cyclopean masonry and the living quarters of the house would have been in the story immediately above this and have spread over another and higher terrace to the west (pl. 11, 4). At the south end of the ruins there are signs of a staircase which led down into the basement from the upper story and it is possible that there was even yet another story above that, for the staircase would have allowed it and we know from the evidence of the House of Columns[2] within the citadel that a Mycenaean house could have two stories above the basement. At all events the house was large and important and presumably belonged to a wealthy man (see Plan, pl. 10). In the northernmost room of the basement (Room 1) was a series of large pithoi, each probably about 1.70 m. high, ranged along the walls. Since they had small bases and wide spreading bodies, the pithoi had to be supported on either side by low walls of clay or crude brick (pl. 12, 5). Underneath one of the pithoi there is provision for a fire. At the north end of the main corridor of the basement just outside the door of Room 1 there were found thirty large stirrup jars (each about 0.45 m. high) (pl. 13, 9) whose spouts had been closed with clay stoppers and a cap of clay which was then sealed with a signet (pl. 14, 10).[3] To judge by the condition of many of these stirrup jars, now in the Nauplia Museum, they had originally contained oil, for their clay is heavily impregnated with oil. Probably the pithoi in Room 1 had been used as storage vessels for the liquid. The oil would have been drawn from them as required and packed for merchanting in the stirrup jars which were stoppered and sealed with the signet of the owner of the oliveyard just as if it were the trademark of a brand. The arrangement in Room 1 for heating one of the pithoi also suggests that oil was stored in them, for it is said that in Tuscany provision for heating is always made in an oil store to prevent the oil congealing during cold weather.

In the excavations of 1952 the basement which had been defined by the work of 1950 was cleared and in it inscribed clay tablets were found.[4] These, except for a surface find in 1950,[5] are the first inscribed clay tablets to be found at Mycenae and the first to be found in the Aegaean Area in a purely private house. The first tablet, Fo101,[6] was found behind one of the pithoi in the northeast corner of Room 1. It was broken into three pieces and almost appeared to have been deliberately broken, and thrown away into a corner, just like a torn piece of paper. In the next room to the south, Room 2, in the southeast corner thirty-seven more inscribed tablets were found. The tablets fall into definite groups according to size. There are three sizes of rectangular tablets, Au102 the larger size, Fo101 the second size, and Oe106 a third size. There are also others, long and narrow, which are like small or large labels or dockets, Oe118 and 127. The tablets are made of dull grey brown clay which resembles that from which the undecorated household ware of Mycenae was made. The interior of the tablet is of somewhat coarse clay which often contains small impurities. All, however, were coated all over, front, back, and sides, with a fine mud coloured clay on which lines were incised and the writing of the signs was done. The writing was done apparently while the clay was damp and it does not appear that the tablets were baked but merely allowed to dry, perhaps in the sun. The tablets, however, from this house, the House of the Oil Merchant, have all been baked accidentally in the violent fire which destroyed the house and so preserved them. The effects of the fire can be seen in some of the tablets, especially in Au102 in which the fine surface clay has blistered in the great heat. The conflagration seems to have been deliberate. The stirrup jars and many of the vases found in 1952 in Room 4 were overturned and broken. Further the spouts of some of the stirrup jars had been deliberately broken off presumably in order to spill the oil in them on the floor and so add fuel to the flames. Other stirrup jars seem to have been smashed and yet others to have been unstoppered. Many of the stirrup jars are much distorted by the great heat and in some cases even fused or partially vitrified (pl. **13**, 7, 8). The house was probably looted before it was fired. The tablets found in Room 2 were apparently originally kept on the upper floor and had fallen into the basement with the collapse of the superstructure, for they lay scattered about in the débris in complete disorder.

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[1] *Jour. Hellenic Stud.* (*JHS*) 71: 255–257, 1951.

[2] Wace, *Mycenae*, 95–97, Princeton, Princeton Univ. Press, 1949.

[3] *JHS* 71: 256, figs. 1, 2, 1951.

[4] I had anticipated this discovery, *JHS* 71: 257, 1951.

[5] *Πρακτικά* 1950: 215, fig. 18.

[6] The system of numeration is explained below, see Catalogue.

Two tablets Oe117 and 120 are interesting for they are apparently the upper portions of rectangular tablets like Fo101 which have been deliberately broken off. It seems that when the incised lines for the writing were drawn across these tablets the uppermost line was incised more deeply than usual and that after the first line of signs had been written advantage was taken of the deep incision to snap the tablet in two. This would be equivalent to writing a line at the top of a sheet of paper and then folding it over and tearing off the top line.

Fortunately owing to the number of vases found in it we are able to date the period during which this House of the Oil Merchant must have flourished. Although the stirrup jars which probably contained oil are of several types,[7] they can generally be assigned to the stage of pottery known as Late Helladic III B. Further in Room 4 of the basement among many undecorated pots there were two small painted stirrup jars and a fine spouted bowl of excellent fabric which can all be assigned to the same stage, L.H. III B (pl. **15**, 15–17). A test beneath the floor of Room 5 yielded many vase fragments and most of these can be assigned to the stage called Late Helladic IIIA (pl. 15, 14). Thus the building and the flourishing period of the house can be placed in the late Helladic III B stage, or if we can attempt a more absolute dating, between about 1340 and 1210 B.C.[8] Since there is in the house no pottery later than L.H. III B we can assume that it was plundered and destroyed by fire like other houses outside the citadel shortly before 1200 B.C. This catastrophe may have been due to a civil war as suggested[9] since the citadel was not sacked and burnt until the L.H. III C phase had been in existence for some time. The tablets therefore from the House of the Oil Merchant should be dated to the phase known as L.H. III B, which I would now date 1340–1210 B.C.

Professor Blegen informs me that at Pylos there is evidence showing that the tablets were kept in boxes or baskets which were tied with a string or cord and then sealed with clay seals.[10] It seems that a similar practice existed at Mycenae. On the surface of the slope above the Cyclopean Terrace Building, of which the House of the Wine Merchant forms part, there was found in 1951 a sealing of clay which had been baked hard by fire. The sealing is a triangular lump of clay (0.035 m. long) pinched together with the fingers on a cord or string which passed longitudinally through it (pl. **14**, 12). In the clay was then impressed a signet which shows a design of a procession of three young men apparently bearing offerings (pl. **14**, 13). The impression does not give the complete design of the signet, but the sharpness of the lines and the oval shape suggest that the signet was of metal, perhaps of gold. Further exploration of the large private houses at Mycenae will probably yield not only more tablets, but also, it is to be hoped, more information about the methods of filing or storing them.

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[7] *JHS* **71**: 256, fig. 1, 1951.

[8] The dating (1300–1230 B.C.) suggested by Furumark (*Chronology of Mycenaean Pottery*, **115**, Stockholm, 1941) for this stage is not acceptable, for he gives one hundred and twenty-five years to the L.H. III A stage (which to judge by the amount of pottery so far known cannot have been so long) and only seventy years to the L.H. III B stage (to which belongs an enormous amount of pottery). It is better thus to shorten Furumark's L.H. III A stage and place its end not long after the close of the Amarna epoch and to expand the L.H. III B stage accordingly by the same amount at its beginning. I would put the transition from the B to the C stage in the last quarter of the thirteenth century B.C. Furumark actually dates the end of his B stage and the opening of his C stage to 1230 B.C. I would prefer to regard the last quarter of the thirteenth century as a transitional phase between the B and C stages. Thus I suggest the date 1210 B.C. as an approximate date for the division between B and C. We can tabulate my suggestions with Furumark's thus:

B.C.	Furumark	Wace
1500	L.H. II	L.H. II
1425	L.H. III A	L.H. III A
1400		
1340		L.H. III B
1300	L.H. III B	
1230	L.H. III C	
1210		L.H. III C
1100	L.H. III C end	L.H. III C end

The years just after 1425 B.C. and on either side of 1210 B.C. I would regard as transitional periods between L.H. II and L.H. III A and between L.H. III B and L.H. III C. I would prefer not to try to define at present Furumark's subdivisions of L.H. II, and L.H. III A, and L.H. III C pending the accumulation of further evidence. Precise dating of any phase of Mycenaean pottery is a refinement which our present knowledge does not justify.

[9] *JHS* **71**: 257, 1951.

[10] Compare Evans, *Scripta Minoa* II: 64, Oxford, Oxford Univ. Press, 1952, for a similar practice at Knossos.

Tablet Oe106 has a feature which is not paralleled on any other tablet so far known from the Mainland, though there is a somewhat similar document from Knossos, a sketch of a standing man (pl. 3; drawing, see Catalogue).[11] He stands practically at attention with his legs stiffly set together. His head is in profile and he seems to wear a curious low peaked cap, and perhaps an earring. His hands meet at his waist in front and seem to hold an object, a smallish object, which cannot be recognized. At his waist hangs something that looks rather like a quiver or even the sheath of a broad knife and with it there are indications of a loin cloth or a short kilt. There is no other certain indication of clothing of any sort unless the double line of the left shoulder indicates a short cloak. This sketch is vivid and lively but is less deeply incised on the tablet than the writing on the front. Thus we might suppose that the writing on the front was done while the tablet was still damp, but that the sketch on the back was done when the tablet was beginning to dry. We can hardly imagine as has been suggested that the drawing is a "doodle" done by the hypothetical oil merchant for instance on the back of an old bill. The sketch seems rather to have been done purposely with a more definite object and not to be a piece of casual amusement done in an idle hour. We must seek another explanation.

We know that the walls of Mycenaean palaces and houses were decorated with frescoes of various kinds and subjects and of varying scales. Private houses like the House of the Oil Merchant were adorned with frescoes no less than palaces. In the same room, Room 2, fragments of painted fresco executed in an unusual outline technique were found in the débris fallen from the upper story. Did the fresco painters draw their designs direct on the walls as they painted them or did they make preliminary sketches and plan the composition and scale before they began to draw the fresco on the wall? We can hardly imagine that the frescoes of Tiryns, Mycenae, and Thebes were painted direct without any preliminary studies. The uniformity of the execution and the composition is against this. The frescoes all show in their designs and execution clear evidence of planned composition, for which preliminary studies are a necessity. We know for instance that the fresco painters of the modern Town Halls of Stockholm and Oslo made preliminary studies at first, of course on a small scale, before executing the great compositions on the actual walls. The careful design and drawing of the Mycenae frescoes indicates that the Mycenaean fresco painters most probably worked by similar processes. Thus we may perhaps regard this sketch on the back of tablet Oe106 as a sketch by a painter composing a design for a fresco. More such sketches on clay tablets may well be found in the future at Mycenae, Pylos, Thebes, or other sites. Yet another point must be considered. All serious students of Mycenaean architecture agree that the great buildings like the Treasury of Atreus, the Megaron at Tiryns, and even the House of the Oil Merchant itself must have been designed and planned before ever construction actually began. If the architects made plans, on what material did they make them? Did they have papyrus or linen or soft stone slabs? Or did they, as we have suggested for fresco painters, sketch their first plans on clay tablets? It is far from impossible that fresco painters and architects both used clay tablets (we know that some of the Pylos tablets are of a yet larger size than those so far found at Mycenae) for their preliminary studies of the frescoes they were designing and of the buildings they were planning. Thus it would not be surprising if other tablets were to come to light with similar sketches on them or even with plans of buildings.[12]

The evidence of the somewhat analogous tablet from Knossos,[13] already referred to above, can be regarded as confirmation of the suggestions just put forward. The Knossian tablet, which in fabric and technique resembles the inscribed examples, bears three designs which are interpreted as sketches for engraved sealstones. They are vigorous, but careless. The importance of this tablet as indicating the use of clay as a draughtsman's material is rightly emphasized. The paragraphs about the Mycenae tablet with the sketch of a man and draughtsman's designs were written before I was aware of the Knossian tablet and so it will be seen that a study of the Mycenae tablet had brought us independently to much the same conclusions as the author of *Scripta Minoa* II. We can expect that future research at Mycenae, Knossos, Pylos, and other sites will produce more tablets of this character.

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[11] Evans, *Scripta Minoa* II: 66. Professor Kramer has kindly called my attention to the fact that human and animal figures occur on tablets of the third and second millennia from Mesopotamia and has sent me the following note. "Perhaps the most interesting is the tablet with the *figure aux plumes,* Parrot, *Tello,* p. 70, see his references in note 101. For the drawings on the Fara tablets see E. Heinrich, *Fara,* Pls. 27, 28: Deimel, *Schultexte aus Fara,* p. 73 (snake on reverse of tablet published as no. 75 of *Schultexte aus Fara*); Raymond Jestin, *Tablettes Sumériennes de Suruppak, Pl. LIX,* CLXXX. For the second millennium (the Fara tablets are all of the third millennium) see A. Moortgat, *Die Kunst des Alten Orients und die Bergvölker,* Pls. 67, 87."

[12] An architectural plan occurs on a clay tablet of Akkadian date from Khorsabad, Frankfort, *Oriental Institute Discoveries in Iraq 1933–1934,* fig. 2, Chicago, Univ. of Chicago Press, 1935.

[13] Evans, *Scripta Minoa* II: 66, pl. XVIII "Gem-Engraver's Sketch." Part of an apparently unfinished sketch is called a sign, p. 66.

It is possible perhaps that Mycenaean fresco painters had a standard repertory of subjects for their designs. Among these would be friezes or processions of men and women of which we have fragments from Tiryns, Thebes, and Mycenae, chariot scenes like those from Tiryns and Mycenae, and perhaps hunting scenes like those from Tiryns. It has been suggested that the scenes of the "chariot vases" and the vases related to them were inspired by the frescoes.[14] Chariot scenes occur in the frescoes of Mycenae and chariot vases are known from Mycenae. A fragment of one was found in the Rhyton well[15] and in 1952 a large piece of a fine example was discovered by the poros wall midway between the tholos tomb called "The Tomb of Aegisthus" and "The Tomb of Clytemnestra." The Warrior Vase is an example of a frieze or procession. If, as suggested, the fresco painters had sketch books of clay tablets these may have been accessible to the vase painters. At all events it is not impossible that the Mycenaean artists and craftsmen kept repertories of standard and popular designs, and these could well have been bundles of clay tablets.

In addition to the tablets from the House of the Oil Merchant and that found by Mr. Petsas in 1950[16] there are collected here the inscriptions on vases which have so far been found at Mycenae. Two of these Z 202 and 203 were found in 1952 and are here published for the first time. The others were known previously. They all appear to be from stirrup jars, like the well-known inscriptions on stirrup jars from Tiryns, Thebes, Orchomenos, and Eleusis,[17] except for Z 207. The use of inscriptions on stirrup jars and the discovery of inscribed clay tablets in a purely private house indicates that the Mycenaeans generally were literate. A well-to-do merchant like the hypothetical owner of the House of the Oil Merchant might be expected to be literate and able to use writing and reading freely in the course of his business. The use of inscriptions, however, on stirrup jars presumably means that more persons than the upper and middle clases could write and read. It would obviously be no use to inscribe stirrup jars if only a few persons could read what was written on them. We can assume therefore that a considerable proportion of the people of Mycenae must have been able to write and read and that writing and reading cannot have been confined only to royal officials and administrative officers. The inscribed clay tablets and the inscribed stirrup jars thus confirm that the people of Mycenae enjoyed a relatively high state of culture.

CATALOGUE OF THE INSCRIPTIONS FROM MYCENAE

The Mycenae tablets are catalogued here in numerical order, with the vase inscriptions following. The line drawings are tracings from photographs, and they are accompanied by a transcription. Restorations are indicated by square brackets [ ], and uncertain signs by a dot ̣ below. The sizes of the tablets are recorded in centimeters, with the horizontal dimension before the vertical.

The tablet found in 1950 by Petsas[18] has been numbered 1. This was referred to in the *Minoan Linear B Index*[19] as **My '50.**

The series of tablets found in 1952 by Wace in the House of the Oil Merchant was assigned the numbers 101 to 140 at the time of the excavation. Of these 101 was from Room 1, behind a pithos, while the rest came from Room 2. These numbers have been retained in order to keep the system of references as simple as possible. The numbers 138 and 139 were later discovered not to be fragments of tablets and are omitted. Some pairs of the fragments discovered seem to have come from the same tablet, although they either can not be or have not yet been actually joined. These are here referred to by compound numbers 103&105, 104&116, 111&136, 113&114, and 115&134. When the joins are confirmed, only the lower number will be retained.

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[14] This question is discussed in two papers recently published in *Arkeologiska Forskningar och Fynd* by Akerström (*En Mykenisk Krukmakares Verkstad,* 32 ff.) und Furumark (*Utgrävingarna vid Sinda,* 59 ff.).

[15] *BSA* **24**: Pl. XIV *d.*

[16] Πρακτικὰ 1950: 215, fig. 18.

[17] Carratelli, "Le Iscrizioni preelleniche di Haghia Triada in Creta e della Grecia peninsulare," *MonAnt* **40**: 603–610, pls. XXX–L, 1945.

[18] Πρακτικὰ 1950: 215, fig. 18.

[19] Bennett, *A Minoan Linear B Index,* New Haven, Yale Univ. Press, 1953.

The Mycenae vases with painted inscriptions have been assigned numbers 201 to 207. Of these there have been published 201, 206, and 207 from Schliemann's or Tsountas' excavations, and 204 and 205 from the House of Columns. 202 and 203 are from the Poros Wall excavated in 1952.

To each of these numbers there has been added a classifying prefix, following the system established in *The Pylos Tablets,*[20] and expanded and adapted to the Knossos tablets in the *Minoan Linear B. Index.*[21] The classes assigned to the Mycenae tablets are Au, Fo, and Oe, all hitherto unused, with X for the unclassifiable fragments, and Z for the painted vases.

In the *Minoan Linear B* Index the inscriptions from Mycenae and elsewhere on the Mainland were distinguished by printing in bold-face type, while Pylos references were in Roman, and Knossos were in Italics. As more collections of documents are found, this sort of convention obviously cannot be kept up, and it will frequently be necessary to add an indication of the source to the identification. It seems best to recommend the use of a series of italicized prefixes, as *Kn, Py,* and *My,* to be used only where necessary to avoid confusion. Thus when there is no likelihood of confusion the prefixes of source may be omitted, and likewise (except at Pylos, where it is a part of the published numeration) the classifying prefix may be omitted from references to the tablets.

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[20] Bennett, *The Pylos Tablets,* xi–xii, Princeton, Princeton Univ. Press, 1951.

[21] pp. xii–xxiv.

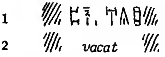
CATALOGUE

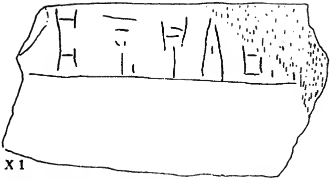
OF THE INSCRIPTIONS FROM MYCENAE

THE MYCENAE TABLETS

Mycenae 1950

X 1 Pl. 1 ca. 8 x ca. 3 cm. Πρακτικά 1950: 215, fig. 18.

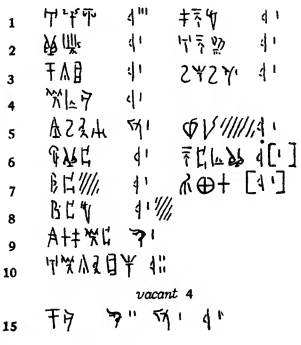


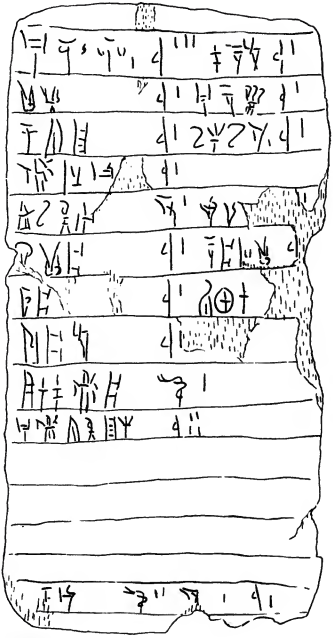


X 1

Mycenae 1952 House of the Oil Merchant Room 1, northeast corner, behind pithos

Fo101 Pl. 1 7.5 x 14.5 cm.

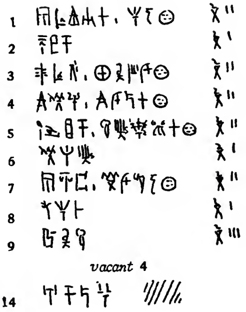

1
2
3
4
5
6
7
8
9
10
vacant 4
15

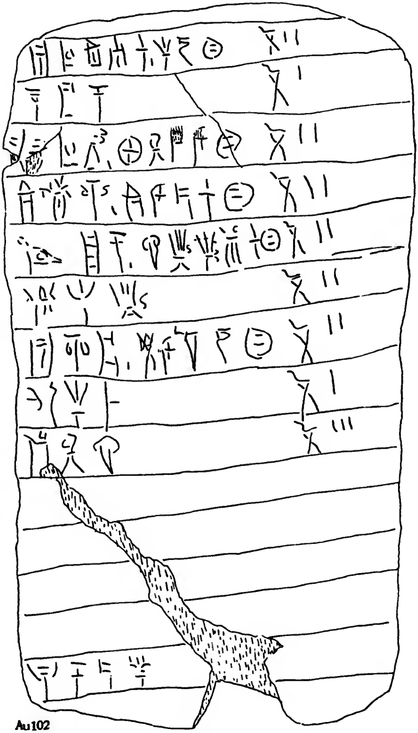


Fo101

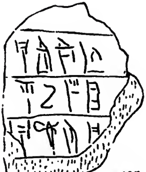
Mycenae 1952 House of the Oil Merchant
Room 2

Au102 Pl. 2 9.5 x 17 cm.

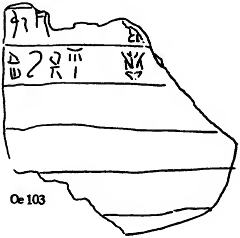

1
2
3
4
5
6
7
8
9
vacant 4
14



Au102

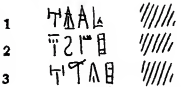


Oe105

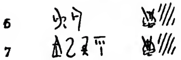


Oe 103

Oe103&105 5.4 x ca. 12 cm.
(Oe103 and 105 are probably from the same tablet, but have not yet been joined)
Oe103 Pl. 3 5.4 x 5.4 cm.
Oe105 Pl. 3 3.2 x 4.2 cm.



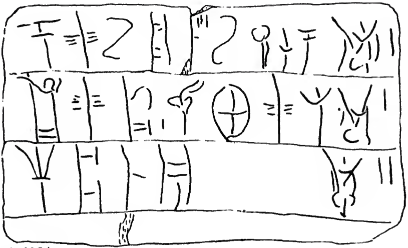
indefinite number of lines missing



vacant 3

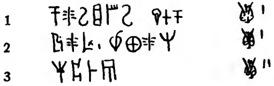
Oe105 Pl. 3 (see Oe103 to which Oe105 is probably to be joined)

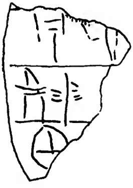
Oe106 Pl. 3 8.2 x 5.5 cm.
Text on obverse, sketch on reverse.



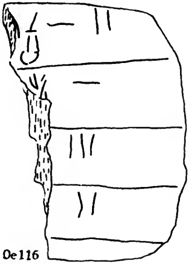
Oe106 '

Oe104&116 ca. 11 x 6.2 cm.
(Oe104 and 116 are probably from the same tablet, but cannot be joined)
Oe104 Pl. 3 2.9 x 4.3 cm.
Oe116 Pl. 3 4.1 x 6.2 cm.

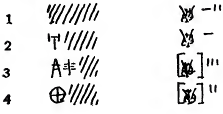


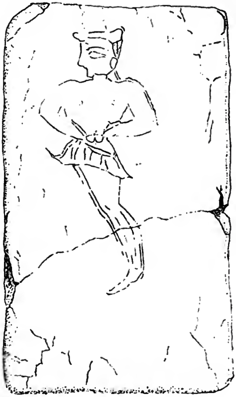


Oe104

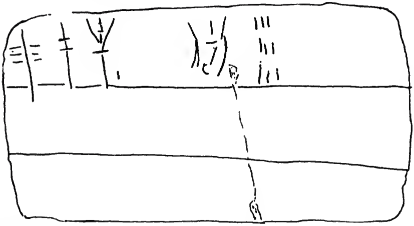


Oe116



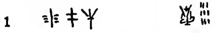


Oe106 reverse

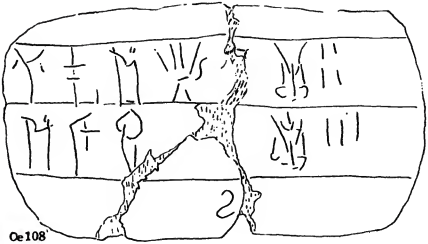


Oe107

Oe107 Pl. 4 9.4 x 4.9 cm.

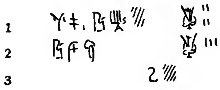


vacant 2

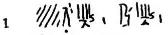


Oe108

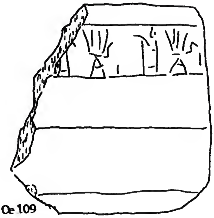
Oe108 Pl. 4 9.5 x 5.3 cm.



Oe109 Pl. 4 4.6 x 4.8 cm.

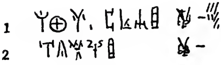


vacant 2

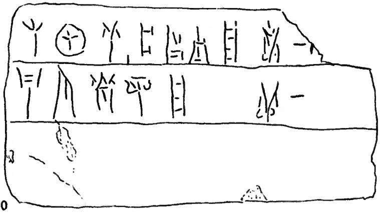


Oe109

Oe110 pl. 4 8.5 x 4.8 cm.

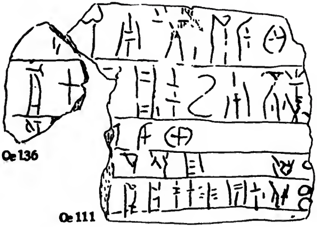


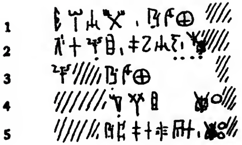
vacat



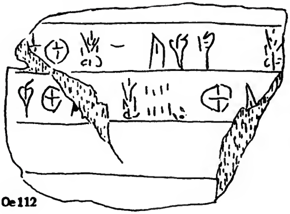
Oe110

Oe111&136 7.1 x 5.8 cm.
(Oe111 and 136 are probably from the same tablet, but have not yet been joined)
Oe111 Pl. 5 5.8 x 5.1 cm.
Oe136 Pl. 5 2 x 2.8 cm.

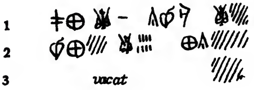

Oe136
Oe111



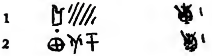
The reading at the end of line 2 is by no means clear, and there may be writing in the space below line 5.

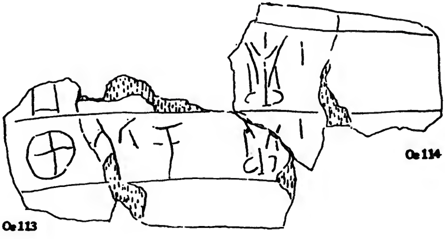


Oe112 Pl. 5 6.5 x 4.8 cm.

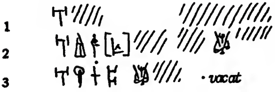


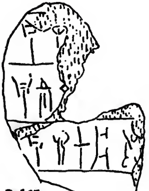
Oe113&114 10 x 4.9 cm.
(Oe113 and 114 are probably from the same tablet, but have not yet been joined)
Oe113 Pl. 5 6.9 x 3.5 cm.
Oe114 Pl. 5 4.9 x 3.8 cm.

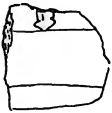



Oe114
Oe113

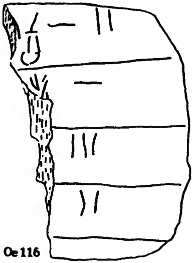
Oe115&134 ca. 9 x 4.7 cm.
(Oe115 and 134 are probably from the same tablet, but cannot be joined)
Oe115 Pl. 5 2.2 x 4.7 cm.
Oe134 Pl. 5 2.5 x 2.5 cm.

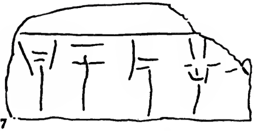



Oe115

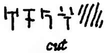

Oe134

Oe116 Pl. 3 (see Oe104 to which Oe116 is probably to be joined)

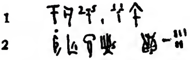

Oe116

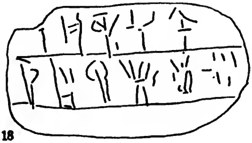

Oe117

Oe117 Pl. 5 5.7 x 2.8 cm.

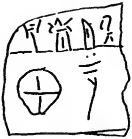


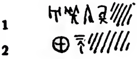
Oe118. Pl. 6 5.7 x 2 cm.

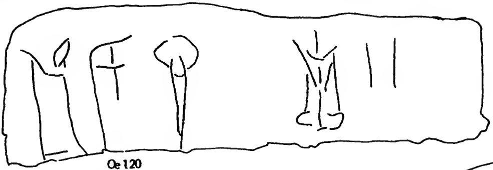



Oe118

Oe119 Pl. 6 3 x 3.1 cm.

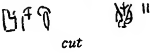

Oe119



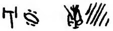


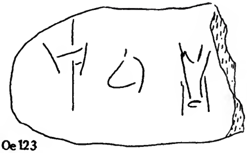
Oe 120

Oe120 Pl. 6 11 x 3.5 cm.

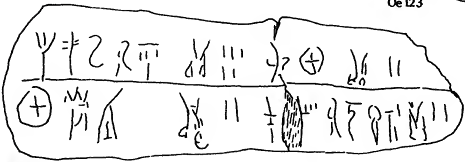


Oe123 Pl. 6
5.4 x 3.2 cm.



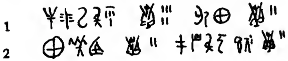


Oe 123

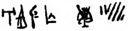


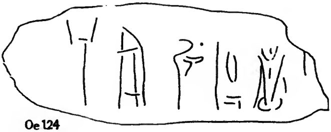
Oe 121

Oe121 Pl. 6 10.8 x 3.7 cm.

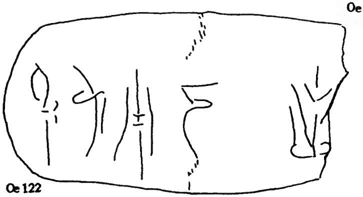


Oe124 Pl. 6
7.9 x 2.7 cm.



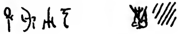


Oe 124

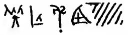


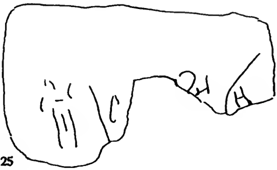
Oe 122

Oe122 Pl. 6 7.8 x 4.2 cm.



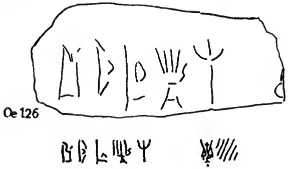
Oe125 Pl. 7 6.2 x 3.8 cm.



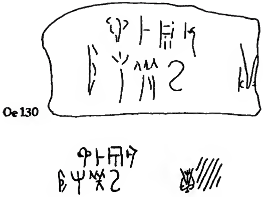


Oe125

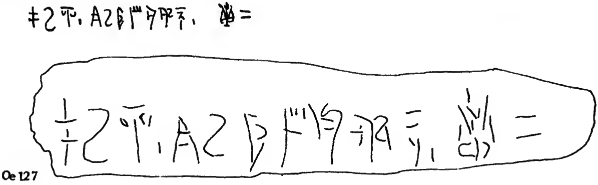
Oe126 Pl. 7 6.2 x 3.8 cm.



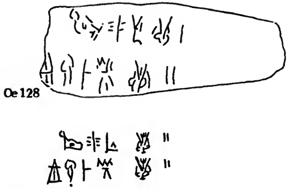
Oe130 Pl. 7 5 x 2.6 cm.



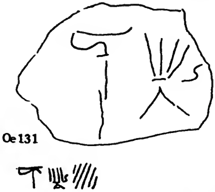
Oe127 Pl. 7 13.4 x 2.8 cm.



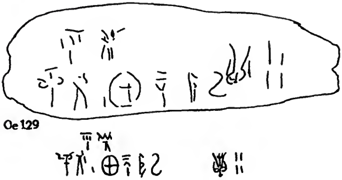
Oe128 Pl. 7 5.6 x 2.1 cm.



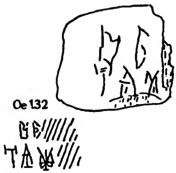
Oe131 Pl. 7 4.9 x 3.2 cm.



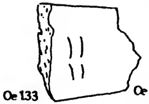
Oe129 Pl. 7 7.9 x 2.5 cm.



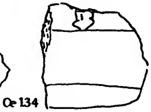
Oe132 Pl. 7 2.6 x 2.5 cm.



Oe133 Pl. **7** 2.3 x 2.2 cm.



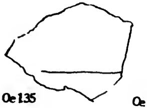
Oe133



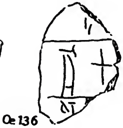
Oe134

Oe134 Pl. **5** (see Oe115 to which Oe134 is probably to be joined)

Oe135 Pl. **7** 2.7 x 2.3 cm.



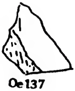
Oe135



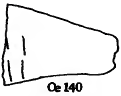
Oe136

Oe136 Pl. **5** (see Oe111 to which Oe136 is probably to be joined)

Oe137 Pl. **7** 1.6 x 1.7 cm.



Oe137



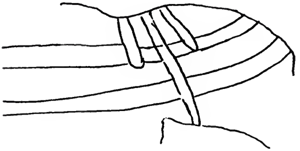
Oe140

(138 - no tablet)
(139 - no tablet)

Oe140 Pl. **7** 2.6 x 2 cm.

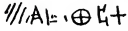
VASE INSCRIPTIONS FROM MYCENAE

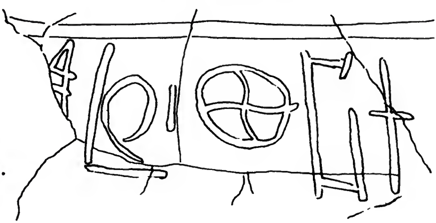
Z 201 Pl. **8** LH III B stirrup vase, Nauplia Museum 1876, from Schliemann's or Tsountas' excavations. *BSA* **25**: 21, fig. 5. Sign and decoration in light on dark.



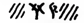
On the spout of this vase, and on the spouts of many of the big stirrup vases from the House of the Oil Merchant (pl. **13**, 9), and from the House of the Wine Merchant (pl. **14**, 10) is the 'sign' or decorative mark +. They are too many to catalogue, and are probably only decoration. Therefore in the *Minoan Linear B Index*, p. 4, delete + **My**.

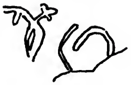
Z 202 Pl. **8** Stirrup vase, Inv. no. 499, from Poros Wall, 1952.



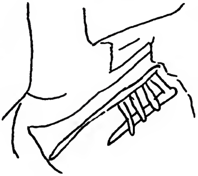


Z 203 Stirrup vase, Inv. no. 506, from Poros Wall, 1952.

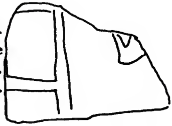




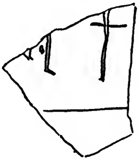
Z 204 Pl. 8 Stirrup vase from House of Columns, 1939. Wace, *Mycenae*, fig. 110f.



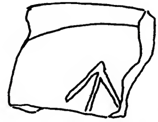
Z 205 Pl. 8 Fragment of stirrup vase from House of Columns, 1939. Wace, *Mycenae*, fig. 71c4.



Z 206 Pl. 8 Fragment of stirrup vase from Schliemann's dump. Wace, *Mycenae*, fig. 71c2.



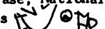
Z 207 Pl. 8 Fragment of kylix (?) from Schliemann's dump. Wace, *Mycenae*, fig. 71c3.

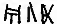


APPENDIX: Inscribed and Marked Objects and Mason's Marks found at Mycenae

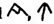
These signs and marks do not necessarily belong to the Minoan Linear B script, or to any other single script. Aside from the mason's marks, they need have been made neither at Mycenae, nor by Mycenaeans.

[208] Stone pestle, marked with the sign , Πρακτικὰ 1889: 19.

[209] Stone vase, National Museum no. 2878, with marks  on handle, Tsountas, Μυκῆναι, 214, Athens, 1893.

[210] Amphora, National Museum no. 2924 or 2925 (or less likely 4569), inscribed on handle with , Tsountas, Μυκῆναι, 213, figs. 1, 2. The amphora is of the shape identified by Furumark (*The Mycenaean Pottery*, 587, Stockholm, 1941) as 13a and (*ibid. p. 74*) as not Mycenaean. With this vase are to be compared two of the four amphorae found at Menidi (Lolling, *Kuppelgrab*, pl. 9, 1-4). These are National Museum nos. 2014-2017, except that the vase with the mark Π (cf. Tsountas, Μυκῆναι, 213) seems to have wandered in the museum to join the Mycenae vase, and has perhaps acquired the new number 4569 (cf. Stais, *Mycenaean Collectoon of the National Museum*, 126, Athens, 1926). Two more vases of the same type from Tsaritsani (Πρακτικὰ 1914: 163, not illustrated) are reported to have inscriptions. According to Tsountas the signs of the Menidi vase were incised while the clay was damp; and according to Pendlebury (*Aegyptiaca*, 76, Cambridge, University Press, 1930) they were incised after the clay was hard.

[211] Ingot with mark Ŧ, *JIAN* 9: 171, pls. 4, 5, 1906; Seltman, *Athens, its History and Coinage*, 4, figs. 3, 4, Cambridge, University Press, 1924.

[212-216] Faience inlays marked , ııı, ıııı, ///, *JHS* 24: 329, fig. 3; Evans, *Palace of Minos* I: 484, fig. 347 A, B, *London, Macmillan, 1921.*

[217] Mason's mark ⊕ on stone from Acropolis wall, *REG* 18: 78, 1905.

[218-219] Mason's marks Ψ (both alike) on two poros blocks from the Treasury of Atreus, *Illustrated London News*, Dec. 23, 1939, 942.

[220] Mason's mark on poros block just south of the Grave Circle by the South House (1950).

[221-223] Pot-marks \, ✱, ✱, Stubbings, *Mycenaean Pottery from the Levant*, 50, nos. F 1-3, Cambridge, University Press, 1951.

COMMENTARY ON THE MYCENAE TABLETS AND VASE INSCRIPTIONS

THE tablets from Mycenae are, in their form, in their contents, and in the elements of their script, entirely comparable to the tablets from the archives of the Palace of Minos at Knossos, and of the Palace of Nestor at Pylos. The script of all of these is that known as Minoan Linear B. The contents of the texts, with only few and uncertain exceptions, are bookkeepers' accounts, and the same types of clay tablets, and the same principles of arrangement of the text on the tablet are found at all three sites. Furthermore, as will be seen below, an unusually-large number of the sign-groups or words of the Mycenae tablets are already known from either Pylos or Knossos, or from both. It is thus apparent that the differences in site, in date, and in the uses of the buildings in which they were found make no difference, but that the same system of writing was in use throughout the Mycenaean world (including the palace at Knossos) from at least shortly before the fall of Knossos to the fall of Pylos.

We must now not hesitate to suppose that the knowledge and use of this script was as extensive as the Mycenaean civilization itself, and that the literate population was by no means small, nor confined to an official or scribal class. Although in many Mycenaean sites no trace of the script has been found, we may suppose that chance and impermanent materials have destroyed a really abundant record. On the other hand, where we do have evidence, it seems conclusive for a wide knowledge of reading and writing. The number of hands which can be distinguished among the tablets shows an amazing number of persons whose writing has been preserved. At Mycenae in an apparently private commercial establishment at least six persons wrote, and at Pylos in the palace perhaps thirty or more hands are represented. At Knossos we can hardly expect fewer. It is true that our records are almost entirely bookkeepers' accounts, and the important place of the ideographic signs in the script perhaps reflects its practical origin, and principal function. But the writing on the vases, which are indeed not many, but widely distributed, hints at a much more general use and knowledge of writing.

The period during which the script is known to have been in use is seen to cover almost four centuries. We cannot tell when it was invented, since we first meet it fully mature (and quite distinct from its cousin, Minoan Linear A), and because of the lack of records we cannot tell when it was last alive. Our first acquaintance with it at Knossos must fall in LM II; at Mycenae the records are from LH III B; while at Pylos they come from the last stage of the Mycenaean civilization, LH III C. Within this period there was surely some development in the script, a change in style, modified forms of the signs, and perhaps innovations as well, yet it is apparent that the scribe of our earliest tablet could have read without difficulty the latest. If we had sufficient material we could trace that development; at present we can only point out characteristics which may be due either to a general development in the script, or to the growth of local schools or traditions.

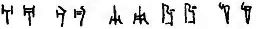
The uniformity of the script in a wide range of time and of place is seen also in the language written with it. There can be no doubt that the same language was used at Knossos in LM II, and at Mycenae and Pylos in LH III B and C. There are sixteen sign-groups out of the eighty-six discrete sign-groups known at Mycenae which are also known at either Pylos or Knossos. This is roughly 18 percent, a high proportion of coincidence. By contrast, ca. 8 percent of the ca. 1900 sign-groups at Knossos, and ca. 11 percent of the ca. 1300 at Pylos are shared. These figures of course do not include the sign-groups which are plainly variant (perhaps inflected) forms of other sign-groups. If these were to be counted, they would add impressively to the evidence for a common language.

It is becoming increasingly apparent that the difference between the Linear A and the Linear B scripts is a serious one, not a matter of a gradual development, nor of an elegant variation, but of a radical adaptation of the old to the new, or perhaps even a new construction following roughly an older model. The languages also, and the names appearing in the accounts are clearly different, and where the same sign is used in both Linear A and B there is no guarantee that the same value is assigned to it. At the same time the affinity of Knossos in LM II in script and in methods of bookkeeping is clearly shown to be with the Mycenaean mainland rather than with the rest of Crete. Is it possible that we should speak of the Minoan Linear (A) Script and the Mycenaean Linear (B) Script rather than of Minoan Linear A and B? We cannot be sure where Linear B was created, or when, but it need not have been at Knossos. Yet it was clearly longer and more widely known and used in the Mycenaean than in the Minoan civilization, and so might well deserve a new and distinctive name.

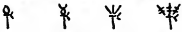
The Syllabary and Ideographic Signs of the Mycenae Tablets

There is no significant difference in the signs used on the Mycenae tablets from those of the Knossos and Pylos tablets. There are naturally minute variations in the shape of the signs, but the repertory drawn upon is the same. There are sixty-one different syllabic signs and five different ideographic signs used on the Mycenae tablets, besides the normal numbers and punctuation. Of these, two syllabic signs are perhaps not quite certainly equivalents of the signs known from Pylos or Knossos with which they have nevertheless been equated. They, with the normal perversity of rare and unusual signs, are not clear in the photographs, and the sign at Pylos with which one of them is compared is itself unique, unclear even on the clay, and fragmentary. It is hoped that despite their rarity further examples of these signs may be found to establish their identity and to give clear evidence of their normal form. The known syllabic signs not yet occurring at Mycenae are twenty-eight in number. None of these is elsewhere of sufficient frequency for its absence from this small body of text to suggest that it was not in use at Mycenae. There is of course no reason to expect a greater number of ideographic signs than has appeared.

The slight variation in the shapes of the signs at Mycenae from those at Pylos and Knossos can be observed in the Table of Forms of the Signs, in the next section on the palaeography of the Mycenae tablets. The noticeable traits are the doubling of the base line in the two characters, and , the simple form of the , and the elaborate form for . The doubling of lines which are normally single is also found in other signs at Knossos and Pylos. Examples are:



It is perhaps impossible in every case to decide whether the simple form or the double is the ideal. A single scribe is likely to treat most of these signs in the same way, and it seems probable that a change in either direction could be introduced by the analogy of similar signs. A similar form of elaboration seems to be the addition of the mark made by two diagonal lines at the middle of the 'ankh'-like sign (the first sign of Oe122). This addition is also found with the following signs, but only at Knossos:



No example of this sort is known at Pylos. It is very tempting, since the mark is found only with certain signs, to suppose that it was intended to modify the value of the sign, but it is likely that the full analysis of the Knossos hands will show that it is instead a characteristic of some scribes, not used by others.

The two doubtful signs are those appearing in Fo101, line 2, 2nd sign-group, 3rd sign, and in Au102, line 5, 2nd sign-group, 3rd sign. Of these the first is a rather complicated sign, and not quite clear on any of the photographs available. It seems, however, to resemble the sign at Pylos (Aa15, 5th sign[22]) more than it does any other. These are then the only two instances of the sign, and they are both doubtful. The second sign is also not quite clear, and the appearance of the photograph suggests that a line may have been erased. The sign has been identified here as the tree-like sign , with an instance of the same elaboration as was seen on the 'ankh'-like sign . This sign also appears at Knossos thus elaborated. However, the cross-bars of the 'branches' are so faint on the photograph that they may be illusions, and it is possible that the lower stem is doubled, and somewhat splayed, if the mark to the right of the clearly drawn line is not an erasure or an irregularity in the clay, but a line and a part of the sign.

The Palaeography of the Mycenae Tablets

A study of the handwriting of these tablets, as it is seen in the photographs reproduced on the plates, has led to the conclusion that six scribes wrote the texts which have been found in the House of the Oil Merchant. In order to indicate the grounds for this probable, but naturally not quite certain, conclusion, we may begin by pointing out the criteria for separating the hands, and then continue by describing and illustrating the characteristics of each hand.

The first and most important criterion is provided by the forms of the signs. Many signs have a fairly large range of variation in shape and construction. The number of strokes used in drawing the sign is not invariable; lines crossed by other lines may be drawn either in one stroke or in two separate strokes, and sometimes single strokes may be replaced by two parallel lines in the same position. Non-essential lines may be added as if they were serifs. In place of straight lines, curves may be drawn, and simple curves may be elaborated. The proportions of the signs are not constant; lines may be relatively longer or shorter, and the angles at which lines meet may increase or decrease. Finally, the clay in which the signs are incised frequently preserved the record of the order and direction in which the strokes were drawn; a line crossing another breaks and distorts it and the end of a line can be distinguished by the clay raised up by the stylus. This variation in form from one hand to another is paralleled by a lesser variation within a single scribe's writing, as it changes from time to time. The scribe's intention may be imperfectly realized when it is distorted by irregularities in the surface, or when he is forced to make use of unusually large or small spaces. This variation greatly complicates the task of identifying the variants which signify a difference in hand.

Other criteria, perhaps generally less reliable, include first the shape and the ruling of the tablet. It appears to be the common practice for the scribe to make his own tablet and to rule it for the specific text to be inscribed on it. This is true not only at Mycenae, but also at Pylos and Knossos. Among the broad, or rectangular, tablets there may be distinguished tablets of different sizes and rectangles of different proportions; tablets carefully squared and those with rounded corners. In the long narrow tablets there are some tapered, either evenly or irregularly from one end to the other, and some which are the same width throughout; the end may be pointed, rounded, or square; and the whole may be short or long, broad or narrow. Some of these with very short texts may be halves or thirds cut from longer tablets, or even the top lines of broad tablets cut off. When the tablet itself may be handled, the profile of the tablet, flat, tapered, or rounded, thick or thin, will also reflect the scribe's normal way of forming his tablet. It may be stated as a general rule that the thicker end is taken as the left end, from which the writing starts, in the long narrow tablets. The ruling of the tablets is generally compulsory in the rectangular class of the Linear B script, and is generally absent in Linear A. The top rule drawn may be either the base for the first line of the text or it may instead define the line's upper limit, especially where the tablets are not fully squared. Furthermore, the spacing of the rules will be more or less uniform in a single hand, either determining or determined by the size of the signs. Whether rulings are used or not, the normal or average height of the signs may be taken as characteristic of a hand. The arrangement of the text on the tablet may be recognized as another criterion. In the long, narrow tablets a single line of writing may be found, or additional sign-groups may be written above the first, with or without a rule. In other tablets a columnar arrangement may be followed, or the text may be written continuously, though never to the extent of breaking a sign-group between two lines, as is frequently done in the less careful Linear A script.

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[22] Bennett, *Pylos Tablets*, 1.

The combination of these criteria is seen in a series of more or less distinctive individual styles. These can be seen when photographs of the tablets are spread out together, and are separated into the groups identified as the six hands. The uniformity of each group, and its difference from each of the others, provides a subjective confirmation of the identification of the six hands, while the general impression of an unassigned tablet may suggest in the first instance its assignment to a hand, later supported by the observation of particular characteristics.

In the study of the hands at Pylos, it has been found that the subject matter of the tablets, as indicated by the ideograms used, and by the repeated formulae of sign-groups within the text assist in identifying the scribe, almost as if there were clerks in charge of special accounts. There also, the record of the exact find-spot of each tablet and group of fragments has often given a clue to the identification of the hand, since we may assume that some files of documents written by the same scribe have been kept apart from other tablets. It has not been necessary to make use of either of these additional methods within this small and homogeneous collection. There is of course no point to an attempt to identify the hand of the tablet X 1, since it was found elsewhere, with one of these six. The writing of the painted inscriptions also deserves a separate study when a larger collection has been made.

Using such criteria as have been described above, the tablets have been sorted into six groups, each of which seems reasonably consistent in its characteristics, and clearly distinct from the others. These hands have been numbered from 51 through 56; the numbers 1 through 49 have been reserved for the hands tentatively identified at Pylos. The differences in the forms of the signs are most clearly shown in the Table of Forms which follows. Besides the forms found in each of the six hands there are shown in the other columns selected forms from Knossos and Pylos, and the forms of the painted inscriptions. The signs from the Mycenae tablets have been traced from the photographs in order to show the shapes as accurately as possible and to preserve the relative sizes of the signs in each hand. It should in most cases be possible to see the order of the strokes despite the loss of the third dimension. The differences seen by other criteria may now be summarized.

- Hand no. 51 [Tablets Oe104&116, 106, 107, 110, 111&136, 118, 124] – average size 9 x 5.3 cm., well squared, ruled without a top rule into 3 lines (exceptionally 4 or 5); the two-line tablet rather rounded, and the one-line irregularly tapered – height of line 1.3 to 1.9 cm. (exceptionally as small as 0.6 cm.).
- Hand no. 52 [Tablets Au102, Oe103&105, 112, 115&134, 119] – tablets with rounded corners, ruled with a top rule (twice into 3 lines) – height of line 0.9 - 1.4 cm. (exceptionally 2.0 cm.).
- Hand no. 53 [Tablet Fo101] – fairly square corners, ruled with a top rule – height of line 0.7 - 1.1 cm.
- Hand no. 54 [Tablets Oe108, 109, 113&114, 117, 126] – average size 9.5 x 5.1 cm., generally rounded shape, ruled with a top rule into 2 lines (twice) or 3 lines (once); the one-line tablet evenly tapered – height of line 1.2 - 1.9 cm.
- Hand no. 55 [Tablets Oe120, 122, 123, 125, 127, 131] – average size 13 x 3.5 cm., one-line tablets, broad and irregular – height of signs 1.3 - 2.5 cm.
- Hand no. 56 [Tablets Oe121, 128, 129, 130, 132] – average size 7 x 2.5 cm., one-line tablets, tapered, bulging, with a second line of text written above the first without ruling – height of signs 0.8 - 1.2 cm.

The Ideograms and the Interpretation of the Tablets from the House of the Oil Merchant

Until the sign-groups can be read with the help of a true decipherment of the Linear B script, the only satisfactory clue to the general interpretation of these tablets is to be found in the ideographic signs. These signs are more readily understood, partly because of the internal evidence afforded by their occurrences in combination with one another, and by the numbers used with them, and partly because of their tendency toward pictography. In the collection from the Oil Merchant's House we have two tablets dealing with different classes of accounts and each containing a fairly long text, while the remaining tablets are all concerned with one commodity. We cannot even now be quite certain of the meaning of the ideograms involved, but within this small group of tablets there is some evidence which can make more nearly accurate our description of their values. Then, knowing something of the kind of commodities accounted for, we may speculate on the nature of the business of the "Oil Merchant." Let us begin by a consideration of the individual signs.

The tablet Au102 adds nothing to our knowledge of the meaning of the "man" sign . Except for the entries in lines 6 and 9, the number following the ideogram corresponds to the number of the sign-groups, which are probably personal names. We can not determine whether the persons thus named are numbered by the ideograms and numbers, or whether the ideograms refer to other "men." The loss of part of line 14 leaves it uncertain whether a total was recorded. The sign-group there is not the normal sign-group accompanying totals, but it might be a name for a class or group of men to which the names listed belong.

The text of the tablet Fo101 is very important, since it establishes the relations of a series of measures whose values were not accurately determined on the evidence of the Pylos and Knossos tablets. In my article on "Fractional Quantities in Minoan Bookkeeping,"[23] it was suggested that was an ideogram representing both a particular commodity and the largest in a series of units used to measure it and materials like it. The fractional measures used with this sign are , , and , of which the smallest, , has not yet

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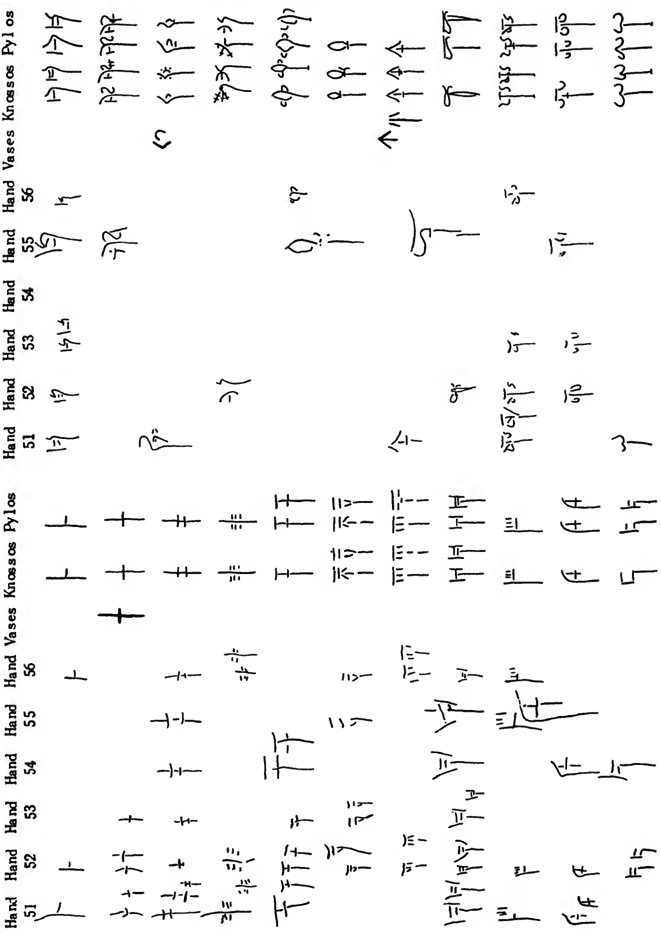
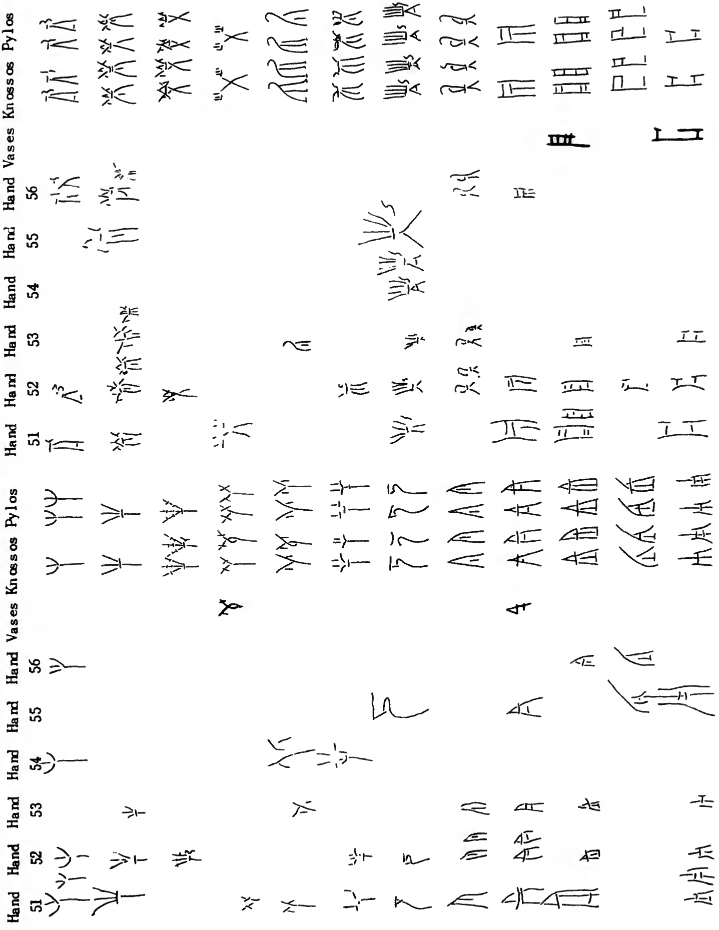
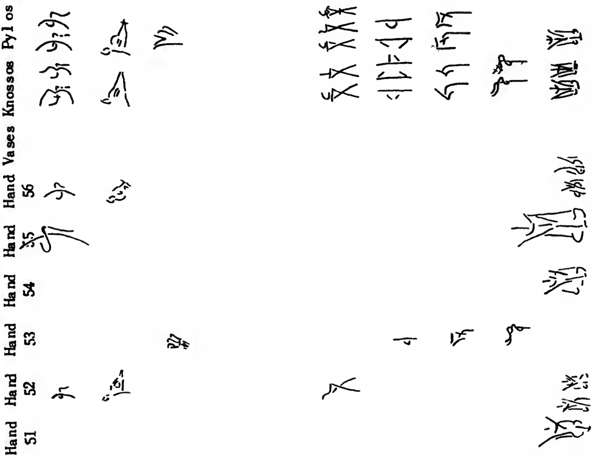
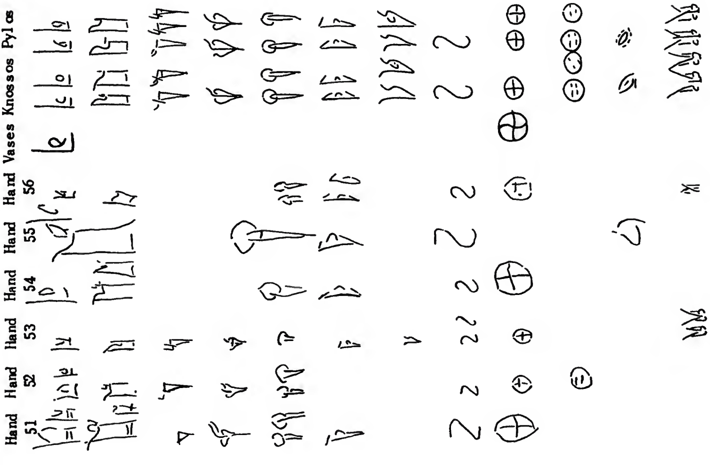
[23] *AJA* 54: 209-211, 1950.

THE FORMS OF THE SIGNS FOUND ON THE TABLETS FROM MYCENAE
classified according to the Hands of the Scribes


Hand 51
Hand 52
Hand 53
Hand 54
Hand 55
Hand 56
Vases
Knossos
Pylos
Hand 51
Hand 52
Hand 53
Hand 54
Hand 55
Hand 56
Vases
Knossos
Pylos


Pylos
Knossos
Vases
Hand 56
Hand 55
Hand 54
Hand 53
Hand 52
Hand 51
Pylos
Knossos
Vases
Hand 56
Hand 55
Hand 54
Hand 53
Hand 52
Hand 51


Hand 51
Hand 52
Hand 53
Hand 54
Hand 55
Hand 56
Vases
Knossos
Pylos


Hand 51
Hand 52
Hand 53
Hand 54
Hand 55
Hand 56
Vases
Knossos
Pylos

appeared at Mycenae. It was further suggested that in this system (the signs 𐄾, 𐄽, 𐄼, and e.g. ᒣ), like the related volumetric system (𐄾, 𐄽, T, and e.g. 𐂎), 𐄾 4 = 𐄽 1, and 𐄽 6 = 𐄼 1 (or 𐄽 6 = T 1). From this point on, however, the systems diverge, in that while T 10 = 𐂎 1, 𐄼 10 would be much more than ᒣ 1. It appears now, that the initial suggestion that 𐄼 4? = ᒣ 1 is unlikely, and that the proper proportion may instead be 𐄼 3 = ᒣ 1. We now know two tablets which have summations of this set of ideograms, *Kn Fp1*,[24] and the present tablet, *My* Fo101.

The items written in *Fp1* are as follows:

	line	ᒣ	𐄼	ᑭ
	2	0	1	
	3	0	2	
	4	0	1	
	5	1		
	6	0	1(or more)	
	7		1(or more)	
	8	0		2
	9	0		1
	10	0		4
Total by addition of items		1	6(or more)	7
Total as written	12	3	2	2

If in interpreting this tablet we use the values ᒣ 1 = 𐄼 4 = 𐄽 24, the minimum total of all preserved entries will come to ᒣ 2 𐄼 3 𐄽 1, and we should have to assume that the 𐄼 3 𐄽 1 had been lost by damage to the tablet. If we use the values ᒣ 1 = 𐄼 3 = 𐄽 18, the minimum total of all preserved entries will come to ᒣ 3 𐄼 1 𐄽 1, and we should have to assume that that 𐄼 1 𐄽 1 had been lost. With the room at our disposal in the broken edge, the second hypothesis might be easier.

Similar in form and difficulty is Fo101. The items are as follows:

	line	ᒣ	𐄼	𐄽
	1			3
				1
	2			1
				1
	3			1
				1
	4			1
	5		1	
			[?]	1
	6			1
				[1 or more]
	7			1
			[?	1 or more]
	8			[1 or more]
	9	1		
	10			4
Total by addition of items		1	1	19(or more)
Total as written	15	2	1	1

If we use the values ᒣ 1 = 𐄼 4 = 𐄽 24, the minimum total of all preserved entries will be ᒣ 2 𐄼 0 𐄽 1, and we should have to assume that 𐄼 1 (or 𐄽 6) had been lost by damage to the tablet. There is, however, very little room to put it in. The only possible places are in the second item of line 5, or in the second item of line 7. In line 5 it would be crowded between the end of the broken word and the reading 𐄽 1 (a part of the sign is preserved in the edge of the break, thus making the simple reading 𐄼 1 impossible); in line 7 there would remain no room after the restoration 𐄼 1, and we should have to add another 1 in line 6 or 8. In either case the sequence of values from high to low within the sections marked out by the arrangement of the text (lines 1-6; 5-8; lines 9 and

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[24] Evans, *Scripta Minoa* II, pl. 19. The form of the ideographic sign ᑭ used in *Kn Fp1* is plainly equivalent to the more usual form 𐄽, as can be seen from a comparison of the tablets *Kn Fs2* and *Fs3*, on the same plate. The difference in form is a function of the hand, and not of the meaning or value of the signs. It will be noticed that the form with the protrusion on the right-hand side is found only at Knossos, and the other at all three sites.

10 either together or separately) would be broken, If, on the other hand, we use the values ϡ 1 = 𐄽 3 = 𐄾 18, the minimum total of all preserved entries will be ϡ 2 𐄽 1 𐄾 1, which is the written total of line 14. In each of the four doubtful places in lines 5, 6, 7, and 8, we should restore or take as complete the reading 𐄾 1; This is the most economical of restorations and exactly fits the broken spaces and the arrangement of the text.

Since neither of these two tablets is complete, and since therefore the conclusion just reached that ϡ 1 = 𐄽 3 depends on restoration, it is worth while to see whether support can be given to it by the frequencies of the numbers occurring with these signs. From all the tablets dealing in the commodities measured by this set of signs, the following tabulation has been made:

𐄽 followed by	1	2	3		
	43	*19*	*1*		
𐄾 followed by	1	2	3	4	5
	16	*10*	*5*	*2*	*3*

This tabulation seems to support the relationship suggested before, ϡ 1 = 𐄽 4, which was indeed suggested in knowledge of the then unpublished single instance of 𐄽 3 (*Kn F 452*). This evidence then contradicts the evidence of two probable summations. It might be expected that a quantity corresponding to 3 quarters of a unit would occur more frequently than *1* time in *63*, and that therefore the distribution fits better the assumption that 𐄽 1 and 𐄽 2 represent 1 and 2 thirds of a unit with 𐄽 3 as an exceptional equivalent of ϡ 1 to be explained away. But this argument from probability is clearly very weak. Again, it would be quite easy to explain the single occurrence of this reading on *F 452* as an exceptional case, thus vitiating the evidence of the frequency table. We might suppose, for example, that the present reading is the scribe's correction of an original record of 𐄽 ॥. This could be done either by erasing the old and writing in the ϡ I,' or more simply by adding a stroke. But no one of the many imaginable explanations is convincing in itself.

Nevertheless, it seems reasonable that the evidence from summations is to be preferred to evidence from frequencies of occurrence, and probable that the discovery of further examples of summations will confirm the relationship of the measures of this system as follows:[25]

ϡ	𐄽	𐄾	𐄿
1	3	18	72
	1	6	24
		1	4

It has already been suggested that this series of measures is used for liquids, and it seems proper here to speculate on the more complete meaning of the sign ϡ, that is, to try to determine what particular liquid it may signify. Evans called it a "bifid vegetable sign." "From the wavy outline of the ear, and the constant division of the stalk into two main stems, it seems probable that we have to do with millet, of the actual storage of which in the Palace evidence has been given above.

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[25] The same sort of difficulty is found in the determination of the values of the other set of measures of volume. Sundwall, in "Zu den knossisch-pylischen Hohlmassen für Trockenes und Flüssiges," *SocScientFennHumLitt* xix.2: 5-7, 1953, has suggested that the values should be read as ₸ 1 = T 10 = 𐄾 80 = 𐄿 320, rather than as ₸ 1 = T 10 = 𐄾 60 = 𐄿 240. The origin of this suggestion lies in a desire to find the elements of the Linear B system of measures in other known systems, and in the reading of *Kn F 51.2*. Here, just as in the case of 𐄽 3, the reading 𐄾 6 might indicate that T 1 counts as more than 𐄾 6; 𐄾 7 seemed unlikely, and Sundwall therefore suggests T 1 = 𐄾 8. There is no example of 𐄾 7, but we should not expect the fraction ⅞ to be at all as common as ¾. But I believe that the same tablet, *F 51*, can be

In the cases when the 'bowl' sign is added, we may therefore conclude that it refers to some kind of drink brewed from this, such as the millet beer made, according to Hekataios, by the Paeonians."[26] It is possible then to suppose from the shape of the sign that a liquid product of millet is meant, that is a beer, although as we have seen from its position in a series of measures the sign refers in every case to a liquid, and could hardly refer to the grain itself. Beer, or accounts of the sale, purchase, or storage of beer, might well be found in any house or palace. However, the principal business of this house seems indubitably to have been in oil, although we need not suppose that this was the only business. We might therefore expect to find in it accounts concerned with oil sooner than records of beer. Pictographically, the twisted top of the sign might just as well represent the gnarled trunk or limbs of olives, but it is not inevitably necessary, and it is frequently misleading to look for a pictographic origin for every sign. We may then make a tentative identification of the meaning of the sign as a particular quantity of olive oil.

Nevertheless, this must remain for some time a suggestion and not a certainty, since there are some peculiar circumstances in its use which still require explanation. In the first place, why are there no more tablets dealing with oil in this house? This is but one tablet, recording a set of sixteen transactions and their total amount. If we accept the general scheme of Ventris in the suggestion of absolute values for these measures,[27] and modify it to agree with the preceding determination of the relative sizes of the measures, the total volume accounted for amounts to ca. 30 liters or 14 gallons.[28] This is not a great amount of business. Furthermore, the quantities of 'oil' on this tablet are rather small, and they more probably represent retail purchases or disbursements than wholesale receipts or inventories, or yields from the merchant's groves, or presses, or workmen. Must we fall back on the explanation that other records were kept on perishable materials, or discarded outside the excavated areas of Mycenae, or simply not found?

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used to support the previously determined value T1 = 6, since the tablet seems to contain a summation:

	line		T		
	1		1	3	
				2	2
	2		1		
			4		1
				6	
Total by addition of items			6	11	3
Total as written	reverse		7	5	3

Here clearly T1 = 6. The reading given here is not clear in the drawing in *Scripta Minoa* II but it may be seen more clearly in the photographs, pls. 22, 23. If the tablet does contain a summation, and if the values were T 1 = 8, we should have to find another 2. This seems difficult.

[26] Evans, *Palace of Minos* IV: 625; Sundwall, *op. cit.* (*supra*, n. 25) 3, suggests that the sign may represent a hop-pole, and so beer.

[27] Ventris, *Work Notes on Minoan Language Research, no. 5,* 28 Jan 1951 (privately circulated), fig. 4, where = 950 g.; T and = 7.12 l., and the other values in proportion.

[28] According to the values of Sundwall, *op. cit.* (*supra*, n. 25) 8, the total would be ca. 23 liters or 11 gallons. But we are not yet in a position to establish the absolute values of these measures. No exact parallel has been found between the relations of the measures and any known system of measures. It seems profitless to identify the units of Linear B with single measures from Egypt, Mesopotamia, or later Greece. The question can be settled best by the discovery of suitable standard vessels or weights at a Mycenaean site.

We may note the isolation of this one record in Room 1 apart from the rest of the tablets, but no conclusions suggest themselves. On the other hand, the fact that the kind of stuff measured apparently need not be specified in each item (the only instances of the sign which indicates the commodity are in line 9 and in the total, line 15) might suggest that this tablet does have to do with the household's principal line of business. In the second place, why have no tablets dealing in this commodity yet been found at Pylos (unless there are some among the new tablets of 1952)? Here is a site, noted today for the excellence of its olive grove, and furnished with a much larger collection of texts, which still seems to preserve no record of the presence or use of olive oil. At Knossos, where there is of course good evidence of extensive oil stores, the sign does appear on a large number of tablets, and sometimes with large quantities. With good fortune we may soon be able to answer these questions satisfactorily.

We now come to , the last of the ideographic signs, which is to be found on the other tablets and fragments from the House of the Oil Merchant. There is nothing new to be learned from the quantities written with it about the relationships among the set of measures to which it refers, since no fractional signs are used here. We are thus brought immediately to the identification of the commodity it represents. But the evidence is not sufficient to suggest an answer to this problem.

We should expect it to be a substance normally measured by weighing. It should also be something which can be found in association with many other items of account, including animals, and measured and unmeasured things. The variety of classes of texts in which it is found is shown by the references to its occurrences in the *Minoan Linear B Index*, p. 115. This wide, almost universal, association would suggest perhaps a medium of exchange. Yet it does not seem to represent the price of anything appearing with it in the same text. In texts such as *Py* Un07 or Un08[29] it is simply one in a series of items, while in the *Kn Dk* and *Dl* series (e.g. *Dk1074* and *Dl943*[30]) the constant proportions of 25 percent and 10 percent respectively cannot reflect a price. Because of its frequent use in varied contexts it is not advisable at present to consider the nature of the Oil Merchant's business as a primary clue to its meaning. We may note however, that two of the sign-groups used with it probably also appear with the sign for "oil" (Oe119.1 and Fo101.10; Oe103 (&105).4 and Fo101.5).

From the fact that in these tablets it is recorded in quantities of from one to two hundred units, we might point out some limitation to the range of things it might represent. If we accept provisionally again the estimate of absolute values made by Ventris,[31] the substance is weighed in units no larger than 2.85 kg. (or 6.3 lbs.). The frequencies with which the various quantities appear are as follows:

Units	Occurrences	Units	Occurrences
1	6	10	3
2	7	12	2
3	2	15	1
4	5	20	1
5	1	100 or more	1
8	1	200 or more	1
9	1		

These figures suggest something which can be easily divided, since only units appear and not fractional quantities. A metal, for example, could not easily be divided unless perhaps it was current already cut or made in standard unit sizes. It should also be something of only moderate intrinsic value, since the smaller fractional quantities apparently do not need to be calculated, and since the range of quantities here represented rises up to 20 units (on the absolute scale to 45.6 kg. or to 126 lbs.). The 100 and 200 units recorded in Oe111&136 are perhaps totals of several transactions. To summarize then, this stuff is weighed in units perhaps approximating 2.85 kg. and in the regular fractions thereof, is of only moderate intrinsic value, is easily weighed out into unit quantities, and is something of common use. But it seems rash to identify it more exactly at this time.

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[29] Bennett, *Pylos Tablets*, 67.

[30] Evans, *Scripta Minoa* II, pls. 74 and 58.

[31] See *supra*, n. 27.

The shape of the sign itself is not now of any assistance in determining its meaning. It is not to be confused with the "balance" or "talent" sign ,[32] which also appears in the series of weights, but represents only a weight (ten times as large as this unit) and not a commodity. The sign we are now dealing with is clearly in origin a ligature. There are some instances indeed where the smaller upper element is omitted in haste or in carelessness, and it is frequently drawn so carelessly that it is now impossible to be sure which sign of the syllabary it was originally. The upper element in the few ligatures which have appeared in the Linear B script seems to be the first sign of the sign-group it represents. This principle would give a sign-group beginning in , , , or . Of these there is one example of the second in the *Minoan Linear B Index*, but it is a proper name, and one of the fourth, but also probably a name. Taking the elements in the reverse order, we find three sign-groups beginning in , those at Pylos clearly proper names, and one beginning in , again a proper name. Since, however, there is a ligature somewhat like this in Linear A, namely ,[33] which is used only as an ideogram, we might assume that the Linear B form developed out of this Linear A ligature, and it might be that the ligature was taken over intact, and that the meaning of the sign-group can be understood only through the language of Linear A and not through that of Linear B.

The Vase Inscriptions

The script of the vase inscriptions is clearly Linear B. It differs only in as much as the different techniques of incising in clay and painting on a pot permit more or less freedom of line. No sign of the Mycenae vases is unexampled in the stylus-written texts. The texts on the vases are incomplete, or abbreviated; they are not accounts, and naturally do not include ideograms. The precise nature of the texts may be clear when the script is deciphered, but there is not enough material here for further discussion.

The Sign-groups of the Mycenae Tablets and Vase Inscriptions

I. The Number of Sign-groups at Mycenae.

Complete sign-groups	76+[2]
Incomplete, discrete sign-groups	8
Incomplete, semi-discrete sign-groups	6
Incomplete, dependent sign-groups	13
Isolated single phonetic signs	3

Definitions: Incomplete, discrete sign-groups cannot be incomplete occurrences of other sign-groups. Incomplete, semi-discrete sign-groups cannot be incomplete occurrences of other sign-groups from the same collection of texts, but can be (but are not necessarily) incomplete occurrences of sign-groups known from other collections. Incomplete, dependent sign-groups can be, but are not necessarily, incomplete occurrences of other sign-groups from the same collection of texts.

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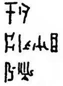
[32] *AJA* 54: 211, and fig. 6, no. 27.

[33] Carratelli, Lc46. *MonAnt* 40: 479, fig. 52, 1945.

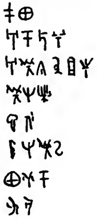
II. Sign-groups from Mycenae found also in other Collections.

Common to Knossos,
Pylos, and Mycenae



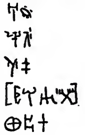
Total 3

Common to Pylos
and Mycenae



Total 11

Common to Knossos
and Mycenae



Total 7+[1]

Grand Total 15+[1]

III. Frequency of Occurrence of Sign-groups from Mycenae.

At Mycenae.
- 4 complete sign-groups occur twice each;
- 1 incomplete, dependent sign-group occurs twice;
- the remainder occur but once each.

Sign-groups common to Mycenae and other collections:

Occurrences	79	112	11	5	3	2	1*
Sign-groups	*1*	*1*	2	2	2	*7*	*1*

* ignoring restoration.

IV. Lengths of Complete Sign-groups.

No. of signs	2	3	4	5	6	7
Sign-groups	*12*	*30*	*21*+[2]	*8*	*3*	2

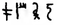
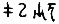
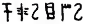
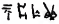
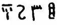
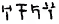
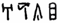
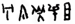
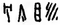
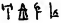
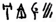
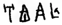
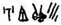
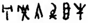
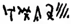
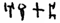
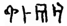
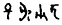
Average length of sign-groups 3.2 signs.

Since the collection of texts from Mycenae is so small, the frequencies of individual signs will not be tabulated.

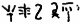
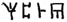
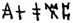
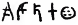
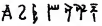
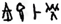
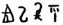
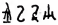
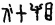
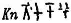
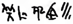
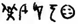
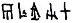
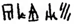
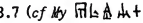
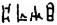
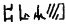
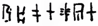
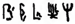
Index to the Inscriptions from Mycenae

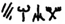
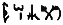
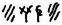
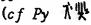
The indexes of sign-groups are arranged to follow the alphabetic sequence of the *Minoan Linear B Index* (see particularly the list of signs used in sign-groups, p. 1). The form of the entries follows that index as well, with the addition of a reference to the position which the item would occupy in that index added to the left of the sign-group. Thus 5B12.5 indicates that the sign-group can be entered on p. 5, 2nd column, between the 12th and 13th items. But note that in the reverse index 79A22 indicates p. 79, 1st column, 22nd *line*. The entries of sign-groups occurring also in other collections have been made to include all the references indicated in the *Minoan Linear B Index*. Five entries of incomplete sign-groups which should now be amended in the light of the texts from Mycenae have been included in their proper places. In the index of the ideographic signs, references are given only to the occurrences at Mycenae, and the references to other collections are not repeated.

VOCABULARY: OR INDEX OF THE SIGN-GROUPS OF THE MYCENAE INSCRIPTIONS

5B12.5		Fo101.1
5B14.5		Oe121.2
7A17.5		Oe127
7A18.5		Oe111.2
7A21		An30.8 Oe112.1
7B5.5		Oe107.1
8B10.5		Au102.3
9P13.5		Oe106.1
10A1		*X 30 X 31 [As40.9 ///* *] F 157.1 Fh366 X 367 Pp499 X 521 Am568 Am600 Am601 [As609.4 ///* *] As650.4 V 655.4 Od666 X 742 B 817 Og833.7 E 842.3 E 846.2 E 849.2 C 912.r2 X 1010 B 1055.9 X 1481 As1516.11.19.24 As1517.10 As1519.12 As1520.7 Fh0484 X 5609 X 5797 X 5889 X 6032* An20.11 Eb33.2 Ep01.2.6.8.9.10<.11>.12.13.14 Ep02[.1 ///].2.3.4.5.6.7<.8>.9.10 Ep03.5.6.7.8.9.10.11.12.13[.14 ///] Ep04.3.6.7.8.9.10.11.12.13.14.15.16.18.19[.20 ///] Eq01.6 Er01.5 Er02.3 Fo101.15
10A2.5		Oe118.1
10B4.5		Fo101.3
11A12.5		Au102.2
11A13.4		Fo101.6
12A5.5		Oe129
12A20.5		Oe(103&)105.2
13A16		An07.3 An18.11 Fn02.7 Au102.14 Oe117
13A32.5		Fo101.2
14A3.5		Oe(103&)105.3
14A11.5		Fo101.1
14B23.5		Oe110.2
14B25		X 1.1
15A10.4		[Oe115.2] Oe124
15A10.6		Oe115.2
15A22.5		Oe(103&)105.1
15B3.5		Oe132
16A1		Fn01.15 Un11.4 Fo101.10
16A1.5		Oe119.1
18A19.5		Oe115.3
19B7		*Ap633.2* Oe123
20A1		*X 114.r X 158.1 V 317.r Fh381 X 450 L 514.1 V 653.1 X 743 V 756 F 760 X 763 Co909.1 Dx963 X 997 X 1035 X 1392 Ra1545 Ra1550 X 5006.1 X 5027.1 X 5342 X 5343 X 5347 X 5646 X 5722 X 5727 X 5865.4 As5932.2* An22.14.15 An32.7 Cn15.9 Jn02.11 Ma19.1 Xb03.1 Xn06.2.10 Xn41.1 Xn47 Xn52.1 Xn89.1.2 Oe104.2 Oe115.1
26B6.5		Au102.8
26B14.4		Oe130
28A5.5		Oe122
28A6.6		Z 201
28B4.5		Oe131
29A11		*Fh362.1 Fh375 X 658 Od689* Oe129

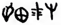
29A28.5		Oe111.2

29B8		*L 642.1 X 692.1 Ak780.1* *X 5871.1 X 5926* Cn31.3 Oe(111&)135.3
31B10.5		Oe110.1
32A8.5		Oe121.1
32B11.5		Au102.1
33A12.5		Oe106.3
33B3		*V 1523.1* Un04.2 Xb01.1 Oe111.2
34A1		*J 693.2* Oe108.1
35A3.5		Oe118.1
36B17.5		Oe112.1
36B18		Cn15.2 (*cf My*)
37A7.5		Fo101.9
37A23		*X 359* Oe104.3 (*cf Kn Py* *etc*)
37B17.5		Au102.4
40A2.5		Au102.4
41B19.5		Oe127
43A21.2		Oe128
43A21.5		Oe103.7
43A21.7		Fo101.5
45B1.5		[Oe111&136.2]
45B3.5		Oe(111&)136.2 (*cf Kn* )
48A9		Cn12.6 Au102.6
48B12.4		Fo101.4
48B12.6		Oe125
49B4.5		Au102.7
51A12.5		Fo101.7
53B18.5		Au102.7
54A12.5		Au102.1
54A13		Cn08.7 (*cf My* )
55A7.6		Z 204
57A20		*Lc535 So0442* Jn01.1.14 Jn02.1 Jn03[.1 ].16 Jn04.1 Jn05.1 Jn06.1 Jn08.1 Oe110.1
60A5.5		Oe106.2
60B8.4		Oe108.2 Oe120
60B8.6		Oe111.1.3
61B26		*Fh347.2 Fh348.1 Fh361 Fh372* *L 758* An14.5 An32.11 An35.e Un01.1 Oe108.1 Oe109.1
61B27.5		Au102.9
62A8.5		Oe111.5
62A9.5		Fo101.8
62A29.4		Oe126
62B1		*B 813 X 5125* An32.6.8 Oe132

30A23.5		Oe111.1 (*cf Kn* )
33B17.5		Z 203
40B27		*X 1037.1* Z 202
46A23		*Dx1309* Oe109.1 (*cf Py*  *etc*)
48A24		*Gg705.3*((*cf My*)
56B25		X 1.1 (*cf Kn* *etc*)

62B21 *X 107 V 337.r3 F 452.3*
X 442.1 X 570 Ld579 L 588.3 As603.2
Se1007.2 X 1034 Ld5845.2
Ae10 An30.7 Cn11.5 En03.6
Eo02.3.4 Va01.1 Xn01.2 Xn53.2
Oe113.1

65A13.5 Fo101.5

65A15.5  Oe106.2

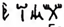
65A17.5 Oe112.2

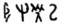
65B0.5 Oe106.1

67A1 *(ideographic Kn & Py)*
Ab27 Ad01 Ad02 Ad03 Ad04 Ad06
Ad07 Ad08 Ad09 Ad10 Ad11
Oe121.2

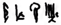
67A5.5 Au102.5

68A4.5 Fo101.6

69A1  *So0442*
[Oe111&136.1]

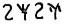
69A13  Ad19
Oe130

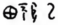
69B8.5 Fo101.7 (*cf Py*)

69B10.5  Oe118.2

69B26 *X 114.r De6060*
Ae07 Eb09.2 Ep03.5 Ep04.9
Oe(111&)136.1

70B13.6 Oe108.3

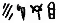
71A7.5  Fo101.3

72A18.4  Oe129

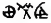
72A18.6 Oe119.2

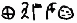
72B13 An18.6 Jn06.5
Oe113.2

72B17.5 Oe112.2

63B21.6  Oe111.4

72B27 Cn06.3 (*cf My*)

73A5.5  Oe121.2

73A10.5  Au102.3

73A19 *X 0494.1*
Z 202

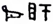
74A23 *X 85 X 480 L 565.1 Ap637.1*
X 660 X 748.4 Se1008 X 1641.1
V 5079.2 X 5623
Ua01.1 Xa13 Xa30 Xn06.3
Oe104.4

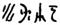
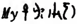
76A7.5 Fo101.2

76B21 Ep01.10
Oe103.6

78A6.5 Oe121.1

78B1.5 Oe128

78B9.5  Au102.5

77A27  An19.12 (*cf My* )

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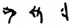
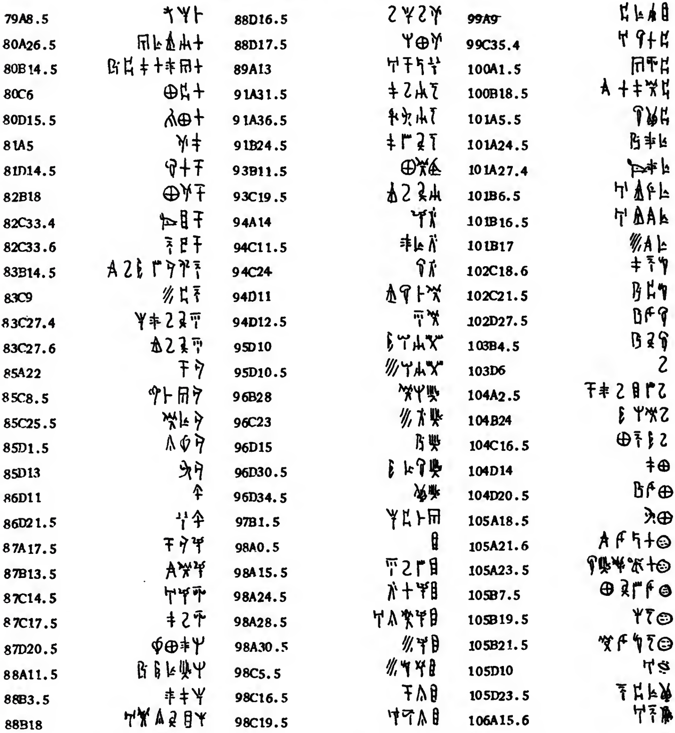
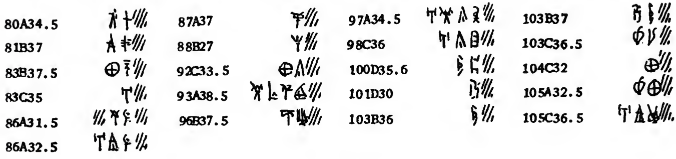
109A1 Au102

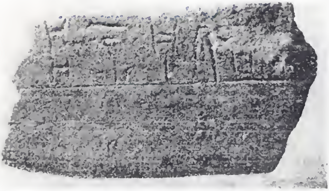
114A2  Fo101

115A2 Oe 103(&105) (104&)116 106 107
108 110 111(&136) 112 113&114
115&134 118 120 121 122 123 124
126 127 128 129 130

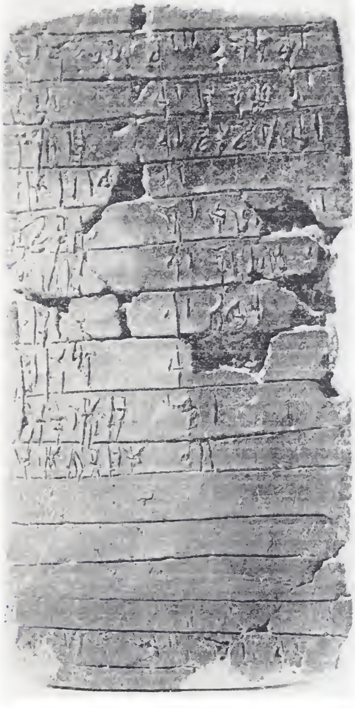
REVERSE INDEX OF THE SIGN-GROUPS


79A8.5
80A26.5
80B14.5
80C6
80D15.5
81A5
81D14.5
82B18
82C33.4
82C33.6
83B14.5
83C9
83C27.4
83C27.6
85A22
85C8.5
85C25.5
85D1.5
85D13
86D11
86D21.5
87A17.5
87B13.5
87C14.5
87C17.5
87D20.5
88A11.5
88B3.5
88B18
88D16.5
88D17.5
89A13
91A31.5
91A36.5
91B24.5
93B11.5
93C19.5
94A14
94C11.5
94C24
94D11
94D12.5
95D10
95D10.5
96B28
96C23
96D15
96D30.5
96D34.5
97B1.5
98A0.5
98A15.5
98A24.5
98A28.5
98A30.5
98C5.5
98C16.5
98C19.5
99A9
99C35.4
100A1.5
100B18.5
101A5.5
101A24.5
101A27.4
101B6.5
101B16.5
101B17
102C18.6
102C21.5
102D27.5
103B4.5
103D6
104A2.5
104B24
104C16.5
104D14
104D20.5
105A18.5
105A21.6
105A23.5
105B7.5
105B19.5
105B21.5
105D10
105D23.5
106A15.6


80A34.5
81B37
83B37.5
83C35
86A31.5
86A32.5
87A37
88B27
92C33.5
93A38.5
96B37.5
97A34.5
98C36
100D35.6
101D30
103B36
103B37
103C36.5
104C32
105A32.5
105C36.5

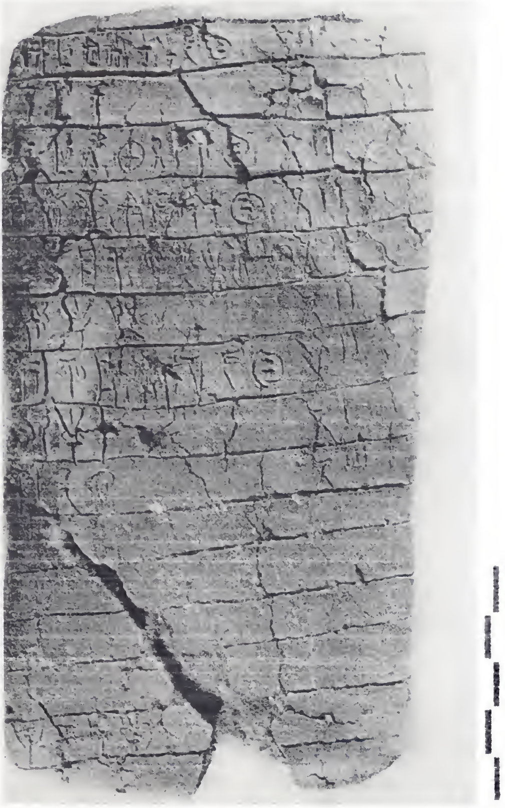


X I



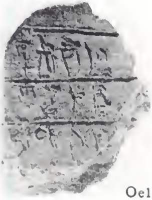
Fo101

PLATE 1.

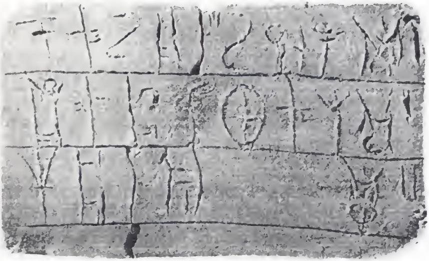


Au102

PLATE 2.



Oe105



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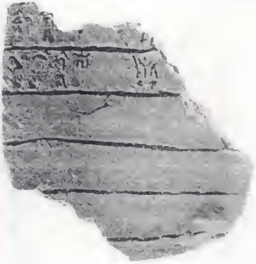

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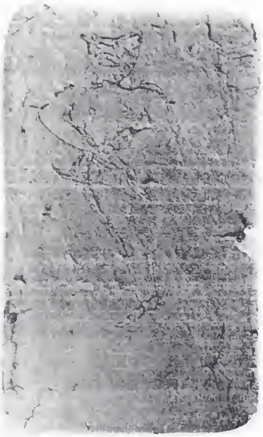
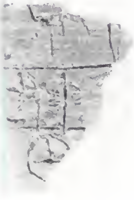
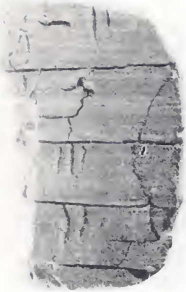


Oe106

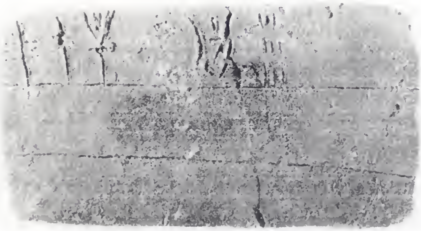


Oe104

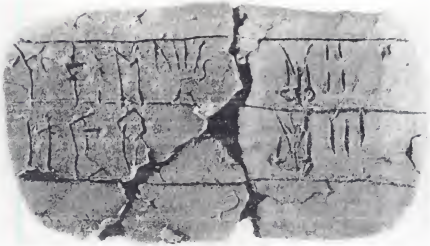


Oe116

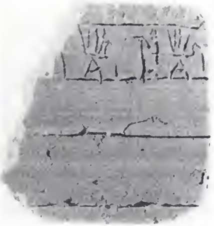
PLATE 3.



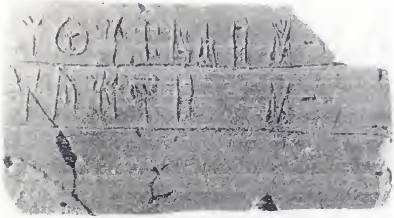
Oe107



Oe108

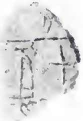


Oe109

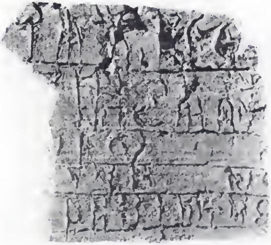


Oe110

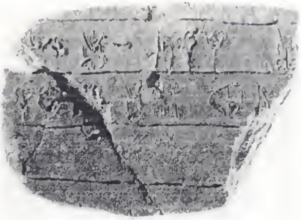
PLATE 4.



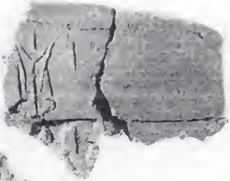
Oe136



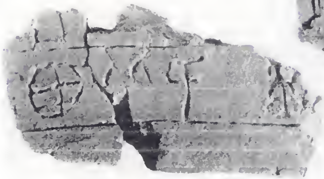
Oe111



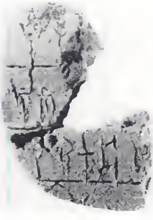
Oe112



Oe114

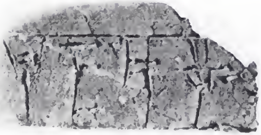


Oe113



Oe115

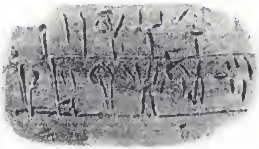
Oe134



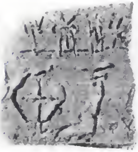
Oe117

PLATE 5.

Oe116: See Plate 3.



Oe118



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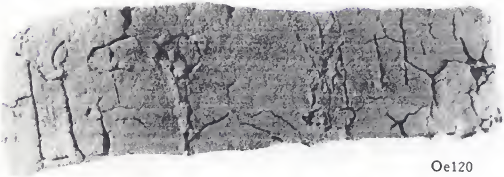

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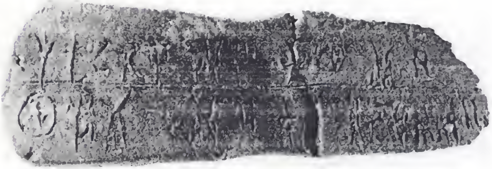

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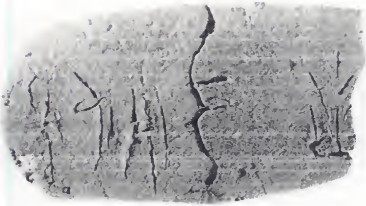

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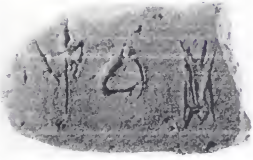

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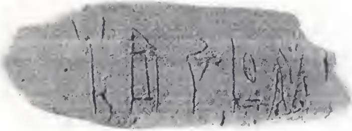

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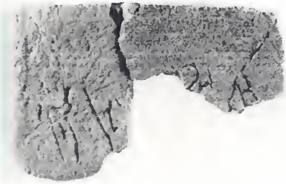
PLATE 6.



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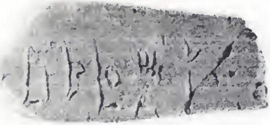

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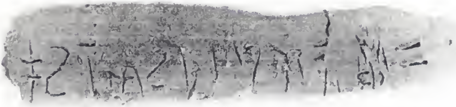

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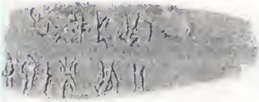

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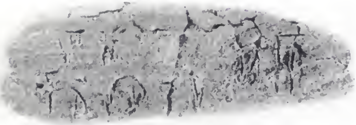

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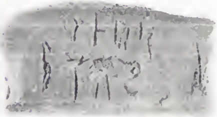

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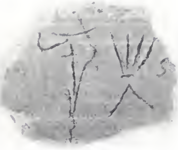

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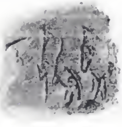

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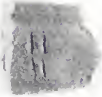

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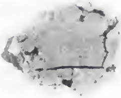


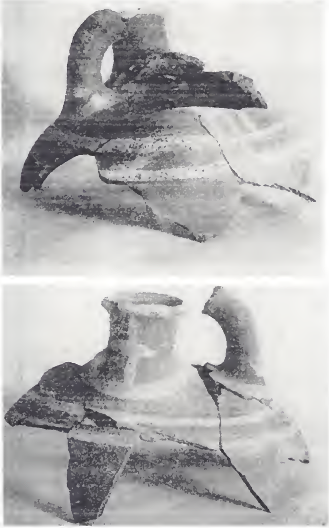
Oe135

Oe137

Oe140

PLATE 7.

Oe134: See Plate 5.
Oe136: See Plate 5



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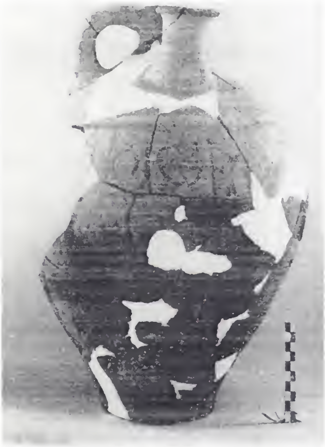

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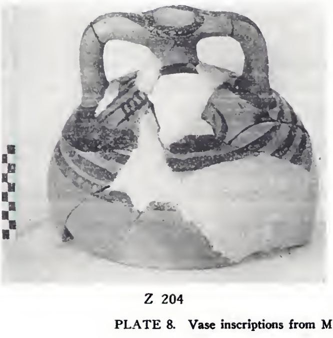

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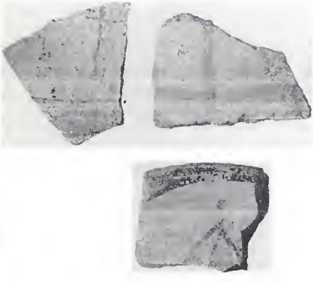
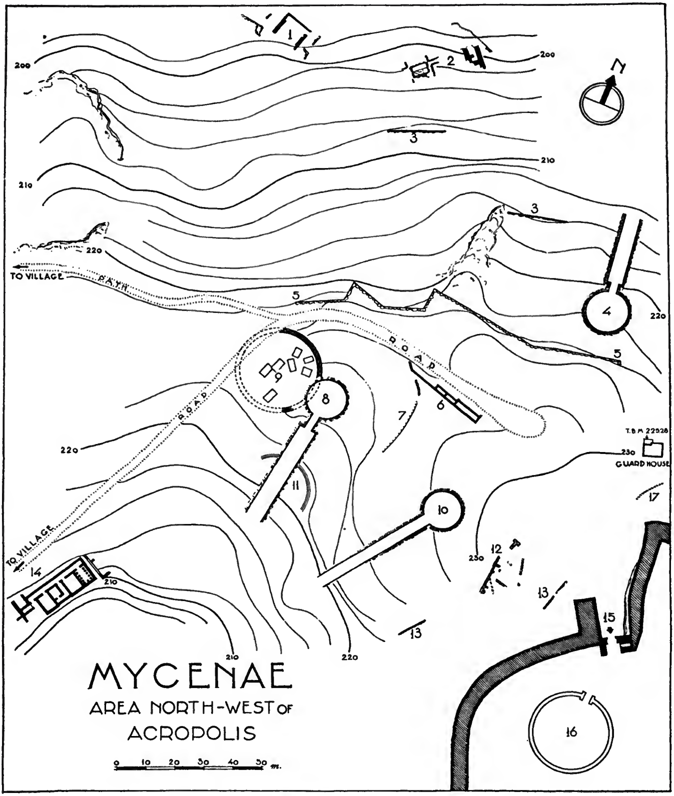


Z 206

PLATE 8. Vase inscriptions from Mycenae (with vase numbers as shown).


MYCENAE
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TO VILLAGE
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ROAD
TO VILLAGE
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PLATE 9. Fig. 1. Mycenae: Area northwest of Acropolis.

1. Cyclopean terrace building (House of Wine Merchant).
2. Petsas' house.
3. Hellenistic terrace walls.
4. Lion tomb.
5. Lower town wall, Hellenistic.
6. Perseia Fountain House.
7. Poros wall.
8. Tomb of Clytemnestra.
9. Middle Helladic grave circle.
10. Tomb of Aegisthus.
11. Theatre, Hellenistic.
12. Prehistoric cemetery, MH to LH II.
13. Mycenaean terrace walls.
14. House of Oil Merchant.
15. Lion gate.
16. Late Helladic I grave circle (Schliemann).
17. Water channel.

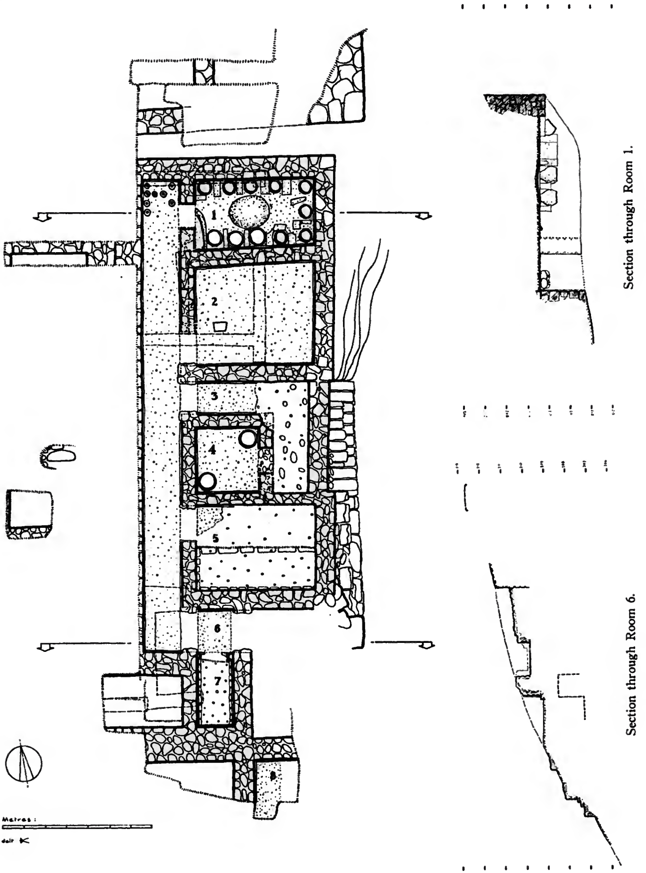
1
2
3
4
5
6
7
8
Metres:
delt K
Section through Room 1.
Section through Room 6.

PLATE 10.

FIG. 2. Plan and section of the House of the Oil Merchant.

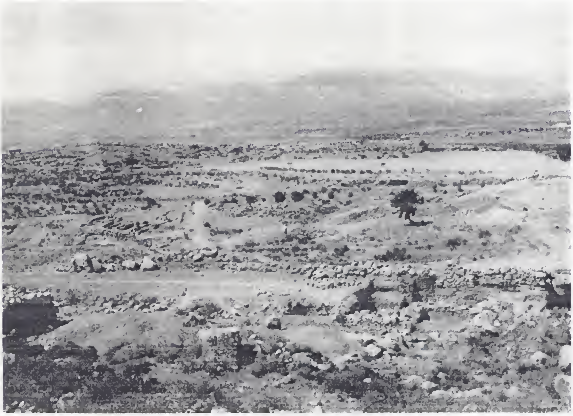

FIG. 3. General view.

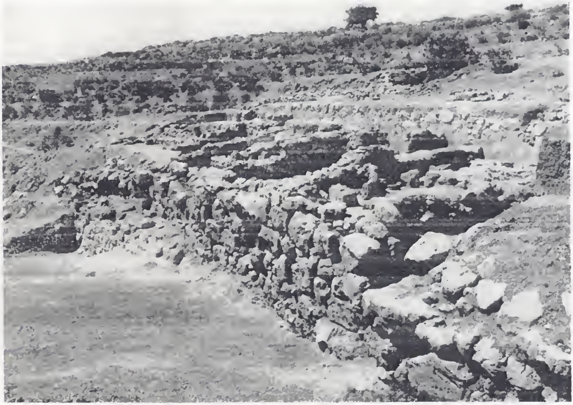

FIG. 4. Basement.

PLATE 11. House of Oil Merchant.

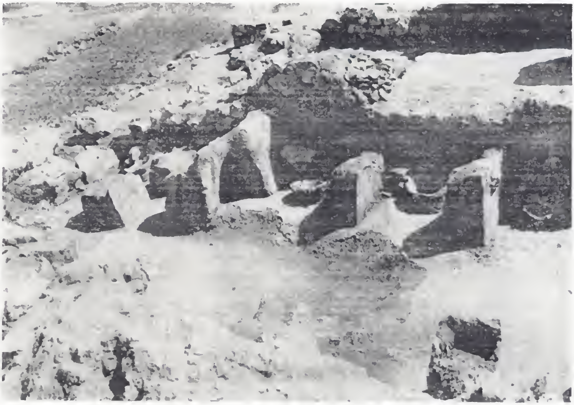

Fig. 5. Room 1.

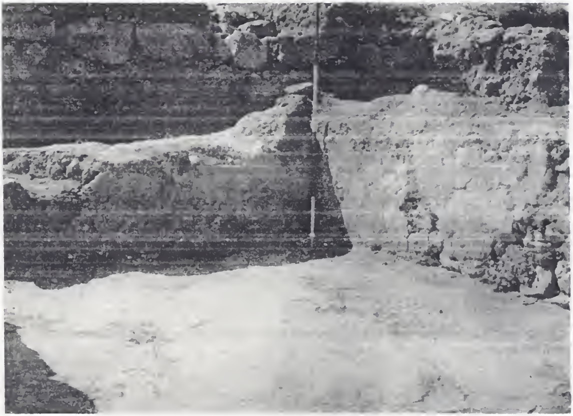

Fig. 6. Room 2.

PLATE 12. House of Oil Merchant.

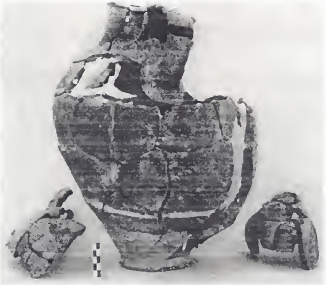

Fig. 7.

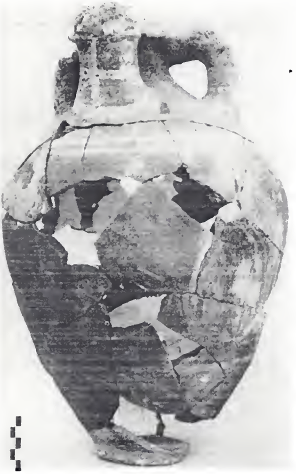

Fig. 8

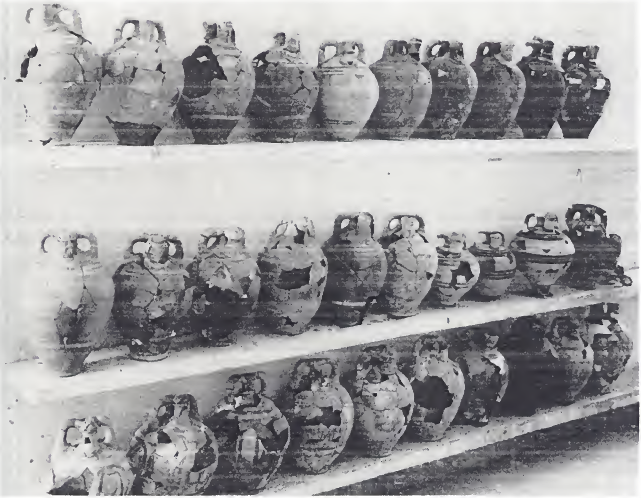

Fig. 9.

PLATE 13. Stirrup jars from House of Oil Merchant.

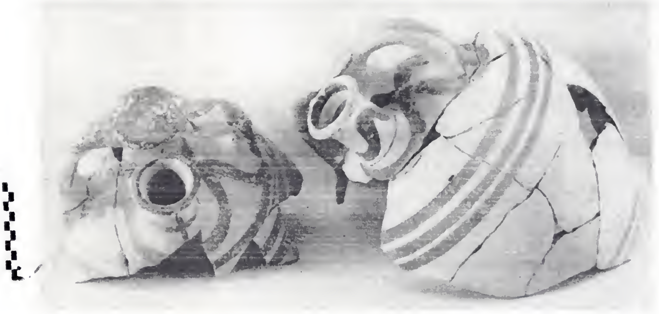

Fig. 10. Stirrup jars from House of Wine Merchant.

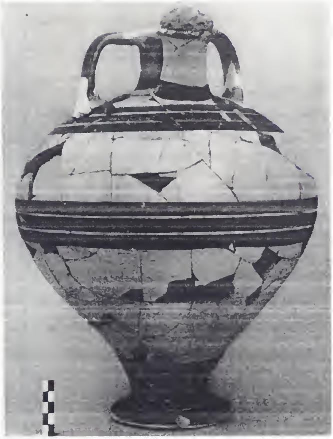

Fig. 11. Stirrup jar from House of Oil Merchant.

Fig. 12. Seal impression.

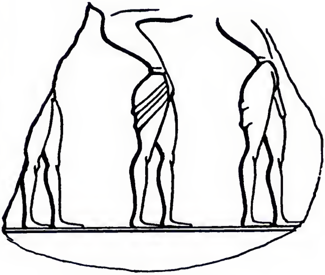

Fig. 13. Seal impression.

PLATE 14.

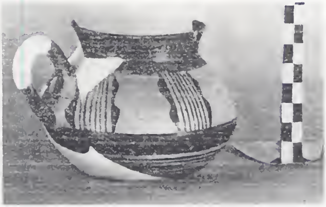

FIG. 15.

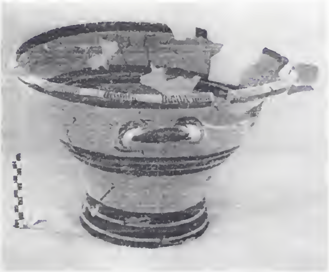

FIG. 16.

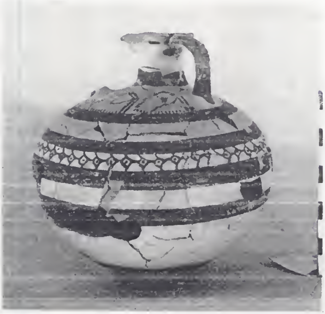

FIG. 17.

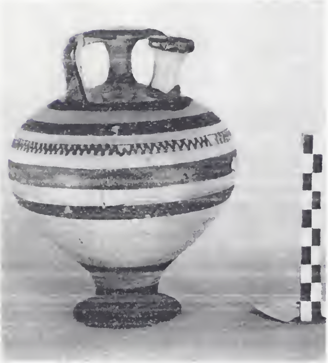

FIG. 18.

PLATE 15. Vases from Rooms 4 and 5, House of Oil Merchant.

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